PAGE 6

ATARI USERS MAGAZINE

Issue 33 May/June 1988
£1.20

THE PRINTER JUNGLE

Which printer for your Atari?



ST

Programming GEM

SPECTRUM 512
MASTERPLAN
GUNSHIP
Moebius
Dungeonmaster
Many reviews

XL/XE

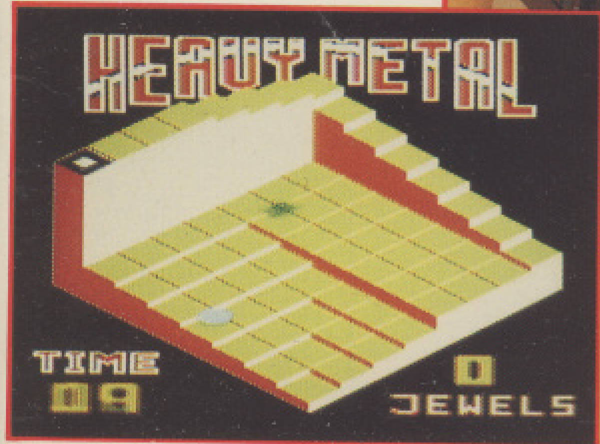
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CRYSTAL CRISIS
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REVIEWS

SPEED ACE
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A greatly improved editor allows upper or lower case letters, automatic line numbering and renumbering on request. Other features include: Advanced string handling, nine new Player Missile Graphics commands, easier joystick and paddle control and structured programming commands. **£49.95**

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ATARI USERS MAGAZINE

C·O·N·T·E·N·T·S

Issue 33 May/June 1988

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SUBMISSIONS

PAGE 6 welcomes and encourages its readers to submit, articles, programs and reviews for publication. Programs must be submitted on disk or cassette, articles should wherever possible be submitted as text files on disk. We seek to encourage your participation and do not have strict rules for submissions. If something interests you, write a program or article and submit it! Appropriate payment will be made for all published programs and articles.

NEXT ISSUE ...
AN ADVENTURE SPECIAL

Adventure reviews
Adventure listings
Adventure HINTS
Adventure guides
... and more!

On sale 23rd June. Copy date 30th May.



PAGE 6 ATARI USERS MAGAZINE

Editorial

Issue 33 May/June 1988

'The Magazine for the Dedicated Atari User'

ISSN No. 0952-4967

THE CREDITS

Full 'official' credits are on page 3, here are the people who made it possible.

Les Ellingham did the Editing

Nicola Parry looked after the ads

Phil Cardwell gave valuable Editorial Assistance

The **Regular Contributors** are ...

Garry Francis
Mark Hutchinson
Matthew Jones
John Davison
John Davison jr
John Sweeney
Paul Rixon

All other contributors for this issue are credited alongside their articles or programs. Thanks to everybody for contributing and thus helping others.

When the going gets hard a few phrases can suddenly make it all worth while. Among those that worked this way for this issue were Hello Friend, Midnight Blue, Little Love Affairs, Worker For The Wind and September Blue. I bet none of you can work that little lot out! Tell you what, the first person to write to the Editor saying who and which albums will get two Albums or CD's of their choice sent off absolutely free!

Serious? You bet! But Atari is supposed to fun as well isn't it?

The next issue of PAGE 6 could feature YOUR article or program. So, send it!

PAGE 6 is put together almost entirely with Atari equipment and software. Hardware used: 130XE, 1050 disk drive, 810 disk drive, 850 Interface, modem, NEC 8023 printer, 1040ST, SM124 monitor, Atari SH204 hard disk drive, Epson RX100 printer, Microstuffer Buffer. Software used: Superscript, Turbo Basic, Tele-Talk, Kermit, Print Wiz and several custom written utilities on the 8-bit. STwriter, PC Intercomm, Thunder and Fleet Street Publisher on the ST.
Copy is prepared on a 130XE using Superscript and various custom written programs and then transferred to the ST via 8-bit Kermit and PC Intercomm. It is then spell checked with Thunder and the layout drafted with Fleet Street Publisher. Finished copy is output from the ST to a Konnect 2 cassette machine and then fed into a Monotype Lasercomp typesetter.

ON PARTICIPATION

A funny thing happened when PAGE 6 went onto the newsstands. We gained five or six times as many readers but, surprisingly, get much less *involvement* than we used to. Sure we get plenty of letters of all kinds but the response to such things as the Readers Awards nowhere near reflects our increased readership. Why is this?

We really have to go back to the early days of PAGE 6 when it was quite difficult to get response from readers in the form of articles and programs or even letters. At the time there was a great fear among ordinary users of writing to the 'big' magazines because many of them had very strict standards for submissions and tended to dismiss anything that wasn't of the top journalistic quality. PAGE 6 worked very hard in the early days to encourage users to submit programs and we gradually broke down those barriers with the result that many readers who had had their work thrown out by other magazines became regular contributors to PAGE 6. And these were not sub-standard contributions either, some of the best Atari program listings to have been published in the U.K. have appeared in PAGE 6 and several of these had been rejected by the 'big' magazines, not because they had any special knowledge but precisely because of the opposite! As a subscription only magazine we built up a good close relationship with our readers and they knew that they need not be afraid of participating in the magazine, whether by submitting articles and programs or by voting in our Readers Polls or by responding to things they had read. This appears to have changed now. We still have our regular contributors but nowhere near as many 'casual' contributors who vote in Readers Polls and the like. Why is this?

I feel that, in many readers minds we have now become one of those 'big' magazines that you feel that you can't contact which is a great pity because it simply isn't the case. Our new readers may not realise the philosophy behind PAGE 6 whilst the older readers may feel that we have moved away from them. Nothing has really changed as far as we are concerned except that there is a lot more work and worry when deadlines have to be met! The underlying philosophy of PAGE 6 stays the same. From the beginning we set out to encourage the exchange of information and ideas between Atari users so that we could all benefit from the experience and discoveries of others. Sharing new knowledge and opinions was one of the most exciting parts of getting into computing and it still should be. Don't be afraid of being part of PAGE 6, get in there and participate. I want the magazine to continue to part of the Atari community and not just yet another general magazine brought out by a publisher that cares about little more than the profit margins.

I cannot leave this issue without returning to the editorial last issue about the merits of the 130XE and ST. Contrary to many opinions received PAGE 6 is not anti ST and never will be. We support Atari as a whole, but occasionally controversial comments have to be made. Two things brought about last issue's comments. The first was that I, along with many others, had been seduced into believing that the ST could do anything. It probably can, but the software that I need for a specific task only appears to exist on the Atari XL/XE. Lots of you criticised but nobody came up with a suggestion for some suitable software! So for that task the XE is better. I don't regret having an ST because I can use the ST for many more things and I still have the 130XE, but supposing someone had got rid of their XL/XE system and then found that the ST didn't do what they wanted? This brings me round to the second contributory matter. We have a large mailing list for our Accessory Shop and I have been astonished at the number of letters received from people who want to be removed because they have sold their ST! Already? These must surely be people who also thought that the ST would do something which, for them, it doesn't do. Supposing they had sold their XL/XE system to buy that ST, they would then have nothing. Surely it is better to keep what you are happy with than end up with nothing?

I recommend that you buy an ST if it will do what you want but if you are happy with the XL/XE why be persuaded that it is not good enough when it is? Of course if you own another machine entirely you should ditch it straight away!

ICD BUYS OUT OSS

OSS were one of the founder companies to produce serious software and support for the Atari. Founder of the company was Bill Wilkinson, one of the programmers responsible for developing the Atari Basic fitted as standard to all Atari machines. Atari Basic was quite different to other Basics and contained many unique features still not found on other machines. With this background Bill Wilkinson formed OSS and began to release a series of top class products for the 8-bit Atari including language enhancements such as BASIC XL and BASIC XE as well as new languages like ACTION! OSS were also responsible for one of the most respected Assemblers available for the Atari, MAC/65.

OSS were always a small company passionately interested in Atari, with Bill Wilkinson writing a regular column for Compute! magazine which became essential reading for all serious Atari users. A year or so ago the company began to find it more difficult to maintain sales with a such a small dedicated product range and there were doubts about their future. They managed to hang on for a while but market pressures eventually brought about their demise.

The loss of old friends in the Atari world is always sad but sometimes changes can bring benefits. OSS products were never officially released in this country with the result that they were always expensive but ICD have now taken over the OSS product range and, as a result of their UK distribution agreement with Frontier Software, OSS software will now be released in this country at substantially reduced prices. Most of the OSS range will be available including ACTION!, a super fast language which swept the Atari world to become the most popular alternative to BASIC. MAC/65 is a powerful macro assembler and editor for programmers who are serious about assembly language and comes on ROM cartridge. Enhancements to the original Atari Basic include BASIC XL and BASIC XE, two programs which add over 45 new commands to Basic yet remain totally compatible. There are also Toolkits for Action!, Mac/65 and BASIC XL which are available here for the first time along with a new word processor called The Writer's Tool.

Frontier software are delighted to be able to make these products available in the U.K. Their Marketing Manager, Martin Walsh, said "The OSS range has proved to be one of the most popular and advanced in the Atari 8 bit market and we are very happy to make the range available in the U.K."

The products will be available through usual dealers as well as direct from Frontier Software. The full range and prices is Action! Cartridge £49.95, Action! Toolkit Disk £19.95, Mac/65 Cartridge £49.95, Mac/65 Toolkit Disk £19.95, BASIC XL Cartridge £39.95, BASIC XL Toolkit Disk £19.95, BASIC XE Cartridge £49.95 and Writer's Tool £49.95.

ATLANTIS APOLOGY

Atlantis Software Ltd. noticed a small mistake on the instructions for their latest Atari release, League Challenge, just after it was shipped out and have asked us to pass on their apologies to frustrated purchasers. The inlay says that you should hold down the OPTION and START keys whilst booting the game but in fact all you need to do is hold down the START key.

League Challenge was Atlantis Software's biggest seller on other machines with entries into the top seller charts on several formats. The BBC version is still selling well almost a year after its release.

COMPUMART SUCCESS

Compumart, the company that started selling blank disks and then went on to become one of the most respected mail order suppliers selling Atari hardware, have proved that the right approach brings success as they move into brand a new office and warehouse unit just two and a half years after commencing to trade. What really really underlines their success is that they are actually buying the property which comprises 6000 square feet of space.

Managing Director, Steve Burke said "The new warehouse is so big it will allow us to continue our expansion, including our service and customer liaison departments. We can also hold much larger stocks and therefore usually guarantee same day despatch on all our products." Compumart have gained their reputation by giving a very fast turnaround and by a policy of ensuring that customers problems are dealt with as quickly as possible, often with replacement hardware shipped out the same day on the promise of the return of a faulty unit. Keeping up the best service when conditions become cramped is not easy which is why Compumart decided to take the plunge with their very own spacious warehouse.

You can now find Compumart at Jubilee Drive, Loughborough where their new telephone number is 0509 610444

SOFTWARE EXPRESS EXPANSION

Software Express, the Birmingham based retailer and distributor, are looking for the sun with the imminent opening of a new shop. No, they are not opening on the Costa Del Sol but lucky Atari owners in the West Country will now be able to find a dedicated Atari shop in an area of the country which has been seriously neglected by Atari retailers. The new shop is in Plymouth, Devon and will carry the usual Software Express full range of Atari hardware and software for both 8-bit and ST machines.

Managing Director Mike Jones said "I have just been down to the West Country and there is definitely a huge interest in Atari in the area but no shops that offer support. We see a new Software Express Atari Centre in Plymouth as being a great success offering a service to both local residents and tourists alike." Next time you are on your holidays, don't forget to look up the shop which is at 9 Exeter Street, Plymouth and will be open from 9 am to 5.30 pm Monday to Saturday but is closed all day Wednesday. The telephone number is 0752 265276.

MAJOR NEW COMPANY TO SUPPORT ATARI

Mandarin Software is a major new software house launched by the Europress Group to market the very best computer games over a variety of formats which will include both the Atari 8-bit and ST. The company intends to set up a series of joint ventures with some of the UK's leading software programmers whereby experienced programming teams provide the very best in software and Mandarin provide the marketing muscle to ensure that the software will receive proper exposure in the market.

The first major coup for Mandarin is the acquisition of Time & Magik, the adventure trilogy from Level 9, which was previously distributed by Rainbird. Level 9 are delighted with the new arrangements as Pete Austin of Level 9 explains "We think that Level 9's programming, combined with Mandarin's knowledge of the market place, their abilities in printing and packaging and their understanding of the need to get products out on time will be an unbeatable combination"

Mandarin have backing of £1 million from Europress and so don't have to be concerned with pushing out inferior product in order to maintain cash flow. They intend to seek out the very best to become "synonymous with quality, providing the Rolls Royce of software games."

Time and Magik has already been released for both the Atari XL/XE and ST and their latest release for the Atari ST is Starquake from Bubble Bus which has been rewritten with totally new graphics plus digitised sound and special effects as well as clever animated sprites.

A major release schedule is promised for the summer as Mandarin continue discussions with several software companies including those who support both Atari 8-bit and ST computers.

ANALOG MAGAZINE GOES DOWN

ANALOG, one of the founder American magazines for the Atari has bit the dust as an independent magazine after several months of rumour in the States about its state of health. ANALOG started life in much the same way as PAGE 6 but because of the huge installed base of Atari 8-bit machines in the States, estimated at 1,000,000, quickly became very successful along with a similar, but totally independent, magazine called ANTIC.

Each magazine developed its own style and ANALOG enjoyed enormous success until the downturn in computer interest towards the end of 1984 when advertising revenues began to drop as many companies went broke. A battle between the two established magazines to prove who was the number one magazine didn't help and when the ST was launched ANALOG felt it had to follow the lead of others and launched a separate magazine called ST LOG. ST LOG always seemed much harder to find than other ST magazines and towards the end of last year ANALOG itself became hard to find. When subscribers failed to receive their copies, something was suspected.

We understand that the ANALOG and ST LOG titles have now been acquired by a large West Coast publisher LFP Inc. Lee Papas and Clayton Walnum from ANALOG will retain editorial control and say that the magazine will change very little except for new paper and added colour. There is talk that each magazine will revert to bi-monthly with ANALOG one month and ST LOG the next. Subscribers have been promised unbroken subscriptions with an extra 3 month extension as a gesture of goodwill. Unfortunately, it seems that the break in publication has spelt the death of interest in this country and it is unlikely that companies such as Software Express who imported the magazine in the past will continue to do so.

ATARI USER SHOW GROWS

Organisers Database Exhibitions continue to be well pleased with the success of the Atari User Shows and have now moved the venue to the newly refurbished West Hall of Alexandra Palace in London.

The show takes place from April 22nd to 24th and is expected to be bigger and better than ever with several new product launches. By the time this issue of PAGE 6 reaches the newsstands the event may well be over but is expected to draw capacity crowds.

MORE SNOOKER

Blue Ribbon have re-released one of the classic Atari snooker games at a new budget price. Steve Davis Snooker, one of the first snooker games to have the computer as an intelligent opponent, is now available on Cassette for £1.99 or Disk at £4.99. Steve stills plays as well at the budget price so you may find this one a real challenge.

THE HUNT IS ON

Grand Slam Entertainments tell us that The Hunt for Red October will be converted to the XL/XE during the summer. This simulation has received rave reviews on other machines so we look forward eagerly to an exciting new program from yet another software house who is keeping the Atari 8-bit range in mind.

Meanwhile, Brian Jobling of Zeppelin Games has promised that the follow up to Speed Ace, which has an excellent review in this issue, will make that game look tame! Watch this space and if the software is good, buy it!

EXPANDING YOUR ATARI

We couldn't squeeze the second part of the series from Mark Fowlis into this issue. Next time, promise!

REVIEWER WANTED

Someone with working knowledge of GFA Basic required to review various GFA connected products. If you can write, drop a line to the Editor.

VARIABLE MYSTERIES

Dear Sir,

Can anyone explain the 'advantage' in program listings of disguising ordinary numerals by putting an 'N' in front of them, as for example in the recent WHIST listing.

Apart from creating a computer mystique and bamboozling the novice, what possible use can such extraneous 'N's be? In the WHIST program this adds well over 1,000 unnecessary characters which might have been better employed in REM statements. The obvious remedy is to leave out all of the N's since they serve no useful purpose but this would invalidate the TYPO codes when entering the program. WHIST is extremely long and tedious to type, the standard abbreviations help, the intrusive N's don't. Programmers, please note!

K. Crocker
Kendal, Cumbria

Ah, but there is a valid reason for using all those variables instead of numbers. Atari Basic uses a system of numbering variables which can be very efficient memory wise and also uses floating point for actual numbers which can be very inefficient. Every time a number is used in a program it takes up six bytes in memory whereas a variable, once declared, uses only one byte. What happens is this. Whenever you use a variable for the first time in a program Atari Basic allocates it a number in a special table called the Variable Name Table. The numbers actually start at 128 so if, for instance, the first variable you type is A=1 it will be allocated the number 128 when stored in memory. Each subsequent variable will then be numbered accordingly. The variable could have been ALPHABET=1 or an even longer word. The first time these are used the full number of bytes for the variable and number are used which would be 8 for A=1 and 15 for ALPHABET=1 but every time the variable is used from thereon it will take up only one byte. Here's why. Whenever you use a variable in a program the Atari checks the Variable Name Table to see if has already been used. If it has it uses the number from the table rather than what you actually type and this can end up saving a lot of memory. Numbers typed in will always take six bytes so one trick is to set a variable to the number you require. If you type N1=1 then whenever you need to use the number 1 in your program you use N1 instead and you will save five bytes each time. As you say in the WHIST program these variables are used almost 1,000 times so you can see that, despite the fact that you have a little more typing to do, around 5k in memory is saved. WHIST, being a very long program probably wouldn't fit into memory without using these variables. Some of those 'weird' programming practices do have a genuine use!

WHY IS IT WRONG?

Dear PAGE 6,

I typed in TYPO 3, but when I tried to run it I keep getting an error message reading ERROR 3 – at line 110. I have repeatedly typed the line but all to no avail. Is the listing incorrect or am I doing something wrong?

N. Lloyd
Coventry

This is one of the most confusing errors for beginners. Although the computer tells you the error is in line 110 what it really means is that the program is at line 110 when it encounters an error. The error will be in a line that the statements in line 110 are referring to. Error 3 is a value error. If you look at line 110 you will see a READ command. This is READing the DATA statements, that appear later in the program, into memory and the error message is trying to tell you it has found a number that is greater than 255. So check the DATA statements carefully and you will find the problem.

TWENTY PLAYERS?

Dear PAGE 6,

I am the proud owner of an 800XL and 1050 disk drive and would like to ask you for some help. As you are no doubt aware, most games for the Atari are for 1, 2 or 4 players but what I need to know is whether there is a game in existence in which up to 20 players can play? The reason for this is that I run a youth club and feel it would be a challenge to put the Atari to good use and involve a number of young people. Can anyone write a game that would satisfy my needs?

Neil Hill
Mansfield

We can get you nearly half way there with a game called Cosmic Crusaders available from the PAGE 6 library but it is a strategy game that may not be suited for youngsters. Twenty players really is pushing it! The only sort of game that we can think of that may be suitable is a trivia or quiz game that could be adapted. There are several in the public domain that might be suitable and if any reader wants to have a go at writing or adapting it we'll gladly pass it on. You've got no chance with a commercial game, you would probably be the only person to buy it!

Write to:
PAGE 6,
P.O. Box 54,
STAFFORD
ST16 1DR

BEGINNERS PROBLEMS

Dear PAGE 6,

Why is it that although PAGE 6 says for all Atari computers I cannot load any of the games listed in the magazine.

I have tried again and again but all that I get at the end of each typed in program is Error line whatever and that is all. Nothing I do seems to work. I've got an Atari 65XE which takes any XE tapes and I have little problems loading them. As soon as I try to record on the tape deck the program I wish to be taped, I type in CLOAD and all seems well at first but as soon as I start typing the program it comes up error again. Am I doing something wrong, if so what?

Ruth White,
Croydon, Surrey

Lots of people are still getting started with their Atari and when you've got no one to help it can be really frustrating. I don't know what sort of manual you get with the 65XE but you should check it all the way through when you get problems, it probably contains the answer but it may not be easy to follow. What you must do to type in a program is just switch on your computer and start typing each line one after the other. Start with the shortest program you can find because you will make mistakes at first. When you have completed the program, put a tape in your cassette deck and press the RECORD and PLAY buttons together. Type, without any line number, CSAVE and then press RETURN. The computer will buzz twice to let you know it is going to save something. Press RETURN again and your program will be saved. Next time you want to use the program switch on your computer and type CLOAD, pressing RETURN twice.

FRUSTRATION

Dear PAGE 6,

In response to your reply to the Vienna Pirates (Issue 32), I am in the possession of the Boulderdash Construction Kit which I have trouble loading. I have gone back to the shop where I bought it three times. As a last resort I wrote to Databyte for advice but there has been no reply since January. Where is the help and backup from the software companies?

If they won't even acknowledge distress calls, good luck to the pirates that may get Boulderdash Construction Kit to load straight away!

Julie Bennet,
Birmingham

I agree that, in general, the software companies could do a lot more in the way of customer support. As far as I know, Databyte have now died. Maybe they were killed off by people pirating their software?

QUICK ARITHMETIC

Dear PAGE 6,

I would like to find a way of doing arithmetic quickly i.e. the short loop of the Mandlebrot set calculator. I am sure there is a wide audience of fractal enthusiasts who crave the same. Could you provoke your technical writers to come up with the answer. PAGE 6 will go down in history, surely!

D.P. Allen
Camberley, Surrey

Over to all you technical readers. Ian Finlayson's tutorial in this issue might give you a clue of one way to solve the problem but if anyone with a maths degree would like to write an article about the use of maths in programming I will certainly consider it, providing, that is, that I can understand it!

MINI OFFICE DEFENCE

Dear PAGE 6,

I too experienced the same 21st character problem when using the mail merge feature of Mini Office II (letters Issue 32). I wrote to Database who immediately replaced my disk free of charge and it now works fine. The 'fix' for extra spaces between data fields is easy (although I agree that a fix is needed), just define a print code string as the printer backspace code (8 on my Star) and put one or two between the field numbers. Mini Office II is the program I use most on my Atari and although it has its limitations I am very pleased with it.

Your editorial praises the XE for word processing and I agree except for two things. First the XE has a severe case of WYSINWYG (what you see is not what you get) and second, no 8-bit word processors I know of support variable spaced characters and full justification which my printer can produce. I have never used an ST but understand that, like the Macintosh (which I have used) you get both with suitable software. Now if someone could do this with the 8-bit ...

Chris Read,
Milton Keynes

THE INSIDE STORY

Dear Editor,

Recently I was reading through some back copies of PAGE 6, and was struck by the contrast between them, and the last 82 page, advert packed, colourful issue. Was it only three years ago that the Editor was appealing for articles to be sent, because he was running out? And was it only that long ago when he turned down an offer to be Editor of a rival magazine? What traumas were behind the couple of lines hinting the previous issue was nearly the last one?

There must be a good story here. Why not write an article giving the history of PAGE 6? How did you start? More importantly, why did you start? There are many questions that need answers. How did you get contributors at first? Do you still have a job? Is the magazine now full time? Who is Harvey Kong Tin? Does he really exist? How did the first copies sell without any subscribers? Why do you have that ageing hippy on your stand at the shows? Is John Davison Jr. really 5 years old? What did you spend your first million on? Has it changed your life? How do you put the magazine together every two months? Reading the small print suggests the hardware, and software, (who is Kermit anyway?) but how about 'A Month In The Life Of A Publishing Magnate' article?

Please don't split the 8-bit and ST sections of the magazine. It may be tempting, especially if each section continues to grow as they have recently, but I for one enjoy reading about the ST even though I have not bought one. As the magazine grows, it would be preferable to move to a monthly publication.

Keep in mind the simple Atari computer users. I use my computer only with commercial software and although I welcome reviews of say, word processors, databases and utilities, I sometimes wonder what I would use them for. To know which is the best font editing, baud transfer utility since kermit is great, but what is a font? What is Kermit? Even when I find out that kermit would allow me to transfer data between two computers, I still have no idea why I should want to. Could I transfer an 8-bit game to the ST? I doubt it.

Many thanks for a terrific magazine, it is nice to know there are other Atari users out there!

J.R. Southall
Pinner, Middlesex

Rather a long letter to print but I have included it because it makes a number of valid points, especially about the 'simple' Atari user, and besides it is a refreshing change to be able to smile at a readers letter! Unlike many other long time users I can still understand that you can great enjoyment out of your Atari without becoming a wizard programmer and long may it be so. A Month in the Life of a Publishing Magnate? Might be interesting, if I knew a publishing magnate I could ask him! Maybe one day I'll write it up but in the meantime you might like to know that most of the time is taken up by staying up till 2 a.m. doing typesetting and paste up and often you run out of time because there are only seven days in the week! I know Harvey Kong Tin still exists because he keeps writing to me and I keep failing to reply. Sorry, Harvey! The first million was spent on cups of coffee to keep me awake and, believe me that much drink does change your life! I've never asked John Davison Jr how old he is but I know that his dad is only 18! It's nice that you can recognise an ageing hippy when you see one but that says just as much about your age as mine! And, by the way, Kermit really is a frog!

Crystal Crisis

Mining for fuel on a distant planet

Can you survive?

While on your way home from a spot of Galactic gallivanting you notice that your fuel gauge is flashing EMPTY ... EMPTY. Checking a copy of your local G.S. (Galactic Survey) map you find a nearby planet which mines the Crystal fuel needed to get you home. With your cash as low as your fuel, you will need to do a spot of thieving. The mining compound is guarded however by a rather large gun. Can you get around the mine before your ship is spotted and destroyed?

When you run the game the title screen will give you details of the plot whilst the character set is being redefined. When the words 'Move Joystick to Continue' appear you are ready to go. When the screen has been drawn you will see your Spaceship on the left-hand side with your ever faithful Robot underneath ready for you to guide him around the mine to recover enough Crystals to allow you to reach your home planet. The number of Crystals required to escape this Level is displayed in the top right-hand corner where you will also see a gun which has been installed to prevent the theft of the Crystals. Smiling to yourself you see that there is a small pile of boulders between you and the gun. The mine owners are, however, very patient and the gun is rather special, it will remove the pile of boulders one by one! The more Crystals you have the less patient they become and so the faster they fire the gun.

As you move around the mine, boulders can obstruct your passage. These can be removed by the activation of the Robot's onboard Laser, (Fire button) but beware for is gravity on this planet and if there is a boulder above it will fall. Should the Robot be underneath he will be an Ex-Robot! You can collect the Crystals, again by pressing the fire button, one after another – as many as you want and when you need to leave just return to the space directly under your Ship to blast off and live to fight another day. Have fun!

WRITE YOUR OWN GAME

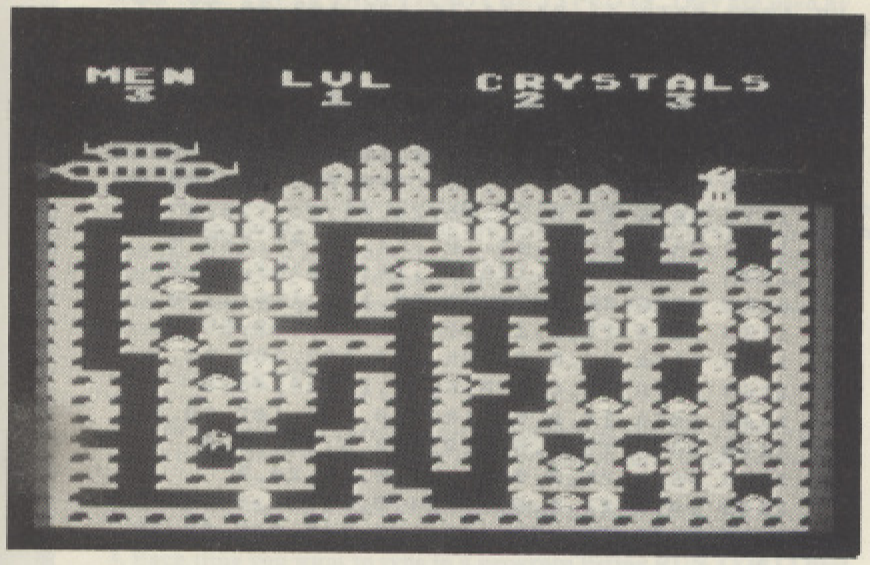
The character set was redefined using the excellent Font Factory utility in Issue 31 so you could change the characters if you wanted. It would be very easy to design your own screen for this game using '(' for the sides and centre walls, a 'b' for the Boulders and (Inv-CTRL E) for the Crystals as shown in Lines 600 to 800. The following variables may be altered to change the way the game plays.

- GD is the delay before the gun fires
- TD is the delay before the Boulder falls
- The array AA holds the column/row position at which a Crystal is plotted.

Any variable with a C or R in it is a screen position variable for something e.g. MC, MR are the start position for the Robot. Line 65 decides how many Crystals are required to leave that level.

```
AE 10 REM ****************************
WI 15 REM *      CRYSTAL CRISIS       *
KI 20 REM *            by             *
QF 25 REM *        P. NEEDHAM         *
QU 30 REM *---------------------------*
UY 35 REM * PAGE 6 Magazine - ENGLAND *
AH 40 REM ****************************
BL 45 REM
RS 50 DIM AA(37):SR=170:SPK=53279:GD1=1
QX 55 GOTO 860
FX 60 LV=1:MEN=3:GOTO 590
TC 64 REM J/STICK ROUT.65-110
OC 65 POKE 77,0:JS=STICK(0):GD=GD+GD1:IF
   GD>90 THEN GOSUB 230
EN 70 SR=SR+1:IF SR=174 THEN SR=171
QA 75 TD=TD-1:IF TD=0 AND RA=1 THEN GOSUB
    205
LX 80 IF CT>(LV+1) AND C=MC AND R=MR THEN
    310
OT 85 IF JS>14 OR JS<7 OR JS=9 OR JS=10 T
   HEN 65
IY 90 POKE (SPK),0
GY 95 IF JS=7 THEN C1=C:C=C+1:GOTO 165
MY 100 IF JS=11 THEN C1=C:C=C-1:GOTO 165
MK 105 IF JS=13 THEN R1=R:R=R+1
IG 110 IF JS=14 THEN R1=R:R=R-1:IF R<7 TH
   EN R=7
ML 115 REM LEFT-RIGHT 99-150
TQ 120 LOCATE C,R,V
DO 125 IF V=32 THEN POSITION C,R1:? #6;"
   ":POSITION C,R:? #6;CHR$(SR):GOTO 65
EY 130 IF STRIG(0)=1 THEN R=R1:GOTO 65
HN 135 IF V=133 THEN CT=CT+1:POSITION C,R
   :? #6;" ":GOSUB 155:GOSUB 845:R=R1:GOT
   O 65
JV 140 IF V=98 THEN POSITION C,R:? #6;" "
   :LOCATE C,R-1,Q
JB 145 IF Q=98 THEN RA=1:BC=C:BR=R-1:TD=1
   6-LV:R=R1:Q=0:GOTO 65
LN 150 R=R1:GOTO 65
NQ 155 SOUND 0,121,10,8:FOR T=1 TO 10:NEX
   T T:SOUND 0,0,0,0:RETURN
FL 160 REM UP-DOWN 165-195
UN 165 LOCATE C,R,V
EL 170 IF V=32 THEN POSITION C1,R:? #6;"
   ":POSITION C,R:? #6;CHR$(SR):GOTO 65
CZ 175 IF STRIG(0)=1 THEN C=C1:GOTO 65
EO 180 IF V=133 THEN CT=CT+1:POSITION C,R
   :? #6;" ":GOSUB 155:GOSUB 845:C=C1:GOT
   O 65
KS 185 IF V=98 THEN POSITION C,R:? #6;" "
   :LOCATE C,R-1,Q
```

```
IY 190 IF Q=98 THEN RA=1:BC=C:BR=R-1:TD=1
   6-LV:C=C1:Q=0:GOTO 65
FM 195 C=C1:GOTO 65
ZK 200 REM DROP ROCK ROUTINE 200-225
SL 205 RA=0:POSITION BC,BR:? #6;"(":LOCAT
   E BC,BR+1,E
WZ 210 POSITION BC,BR+1:? #6;"b":IF E=32
   THEN 225
PI 215 MEN=MEN-1:IF MEN=0 THEN POSITION 2
   ,1:? #6;MEN:POP :GOTO 535
GQ 220 C=MC:R=MR+1:POSITION C,R:? #6;CHR$
   (5R):GOSUB 835
ZR 225 RETURN
```




```
JX 230 REM GUN FIRE ROUTINE 230-305
HO 235 GC=16:GR=5:J=0
QQ 240 SOUND 0,10,0,15
PR 245 POSITION GC,GR:? #6;"◥"
LC 250 GC=GC-1:LOCATE GC,GR,MS
FJ 260 IF MS=190 THEN POSITION GC+1,GR:?
   #6;" ":GOTO 475
UT 261 IF MS<>66 THEN 290
WJ 265 POSITION GC,GR:? #6;" "
NV 270 LOCATE GC,GR-1,MS
TA 275 IF MS<>66 THEN 305
FL 280 POSITION GC,GR-1:? #6;" ":POSITION
    GC,GR:? #6;"B"
NT 285 LOCATE GC,GR-1,MS:IF MS<>66 THEN P
   OSITION GC,GR:? #6;" ":POSITION GC,GR:
   ? #6;"B":GOTO 305
YA 290 POSITION GC,GR:? #6;"◥ "
WT 295 SOUND 0,0,0,0
NV 300 GOTO 250
QM 305 GD=0:RETURN
EV 310 REM REACHED END OF LEVEL 310,455
TJ 315 TR1=4:TR2=5:TR3=6:TR4=8
RD 320 POSITION 2,7:? #6;" "
UU 325 POSITION 2,6:? #6;"$"
UP 330 FOR S=1 TO 100:GOSUB 460:NEXT S
ZU 335 POSITION 1,6:? #6;"@$@"
GI 340 FOR T=1 TO 150:NEXT T
HY 345 POSITION 1,6:? #6;" $ "
UR 350 FOR W=1 TO 8
QW 355 TR1=TR1-1:IF TR1<0 THEN 365
ZL 360 POSITION 0,TR1:? #6;" <=> "
TO 365 TR2=TR2-1:IF TR2<0 THEN 375
AL 370 POSITION 0,TR2:? #6;"<===>"
WG 375 TR3=TR3-1:IF TR3<0 THEN 385
RZ 380 POSITION 0,TR3:? #6;"  $  "
BI 385 TR4=TR4-1:IF TR4<0 THEN 397
ZZ 390 POSITION 2,TR4:? #6;" "
UV 395 FOR T=1 TO 60:NEXT T:NEXT W:SOUND
   0,0,0,0
XW 397 IF LV=16 THEN 535
EH 400 SC=CT*100:BS=MEN*100:TS=SC+BS
OV 405 GRAPHICS 17:SETCOLOR 0,12,10
FX 410 POSITION 0,4:? #6;"SCORE=";CT;"*10
   0 ";SC
GH 415 POSITION 0,6:? #6;"BONUS=";MEN;"*1
   00 ";BS
CZ 420 POSITION 0,8:? #6;"LEVEL TOTAL=";T
   S
KA 425 TS1=TS+TS1
LF 430 POSITION 0,10:? #6;"SCORE SO FAR="
   ;TS1
CH 435 IF TS1>SC1 THEN SC1=TS1
CQ 440 POSITION 0,12:? #6;"HIGH SCORE=";S
   C1
UN 441 POSITION 0,14:? #6;"   MOVE  JOYST
   ICK  ":POSITION 0,16:? #6;"   TO   CO
   NTINUE"
JK 443 JS=STICK(0):IF JS=15 THEN 443
FU 450 GD=0:GD1=0:LV=LV+1:MEN=3
PY 455 CT=0:GOTO 590
AV 460 SOUND 0,0,8,T/3:RETURN
AB 465 RETURN
CG 470 REM END OF GAME 470-588
JP 475 BC=4:FOR S=-15 TO 15
FJ 480 SOUND 0,200,4,15-ABS(S)
LY 485 SOUND 1,255,4,15-ABS(S)
HJ 490 SOUND 2,220,4,15-ABS(S)
JM 495 SOUND 3,150,4,15-ABS(S)
XJ 500 POSITION 4,5:? #6;"'"
HJ 505 BC=BC-1:IF BC<0 THEN BC=0
DR 510 POSITION BC,4:? #6;" "
LQ 515 POSITION BC,5:? #6;"'"
FB 520 POSITION BC,6:? #6;" "
KK 525 NEXT S
DR 530 FOR T=1 TO 200:NEXT T
UC 535 GRAPHICS 17:SETCOLOR 0,12,10:FOR R
   =0 TO 3
BF 540 POSITION 0,R
SS 542 IF LV=16 THEN ? #6;"well done fini
   shed":GOTO 547
XJ 545 ? #6;"game over level ";LV
KK 547 NEXT R
YX 550 SC=CT*100:BS=MEN*100:TS=TS+SC+BS
BH 555 POSITION 0,7:? #6;"SCORE=";CT;"*10
   0=";SC
BS 560 POSITION 0,9:? #6;"BONUS=";MEN;"*1
   00=";BS
QM 565 POSITION 0,11:? #6;"TOTAL=";TS
VT 570 IF TS>SC1 THEN SC1=TS
ED 575 POSITION 0,13:? #6;"HIGH SCORE=";S
   C1
ZE 582 POSITION 0,15:? #6;"MOVE JOYSTICK"
   :POSITION 0,17:? #6;"     TO CONTINUE"
BN 583 FOR R=19 TO 22:POSITION 0,R:? #6;"
   game over level ";LV:NEXT R
RG 584 JS=STICK(0):IF JS=15 THEN 584
BE 585 MEN=3:SR=170:GD=0:GD1=1:LV=1:CT=0:
   TS=0:TS1=0
SS 588 GOTO 60
VJ 590 GRAPHICS 17:POKE 756,P
CL 595 POSITION 0,0:? #6;" men  lvl  crys
   tals "
OM 599 REM MAIN SCREEN 590-830
UN 600 ? #6;" "
DG 605 ? #6;"                 "
UA 610 ? #6;" <=>     BBBBB       ";
EL 615 ? #6;"<===>   BBBBBBB    ◩   ";
WD 620 ? #6;" ! !   BBBBBBBBB   ◘   ";
PC 625 ? #6;"((  ((b(((((  ((((b((((";
SP 630 ? #6;"(    bbb    bbb  ( bb  (";
AM 635 ? #6;"(  ((((((  (((((  (  ((  (";
YV 640 ? #6;"(  (( b(  (   bb      (  (";
EE 645 ? #6;"(  (   bb  (((((  ((((((( ";
PT 650 ? #6;"(  ((((((  (        (b  b  (";
UO 655 ? #6;"(  ( bb       (  ( bb  (b(";
CP 660 ? #6;"(  (  ((((((b(  (((((((  (";
NI 665 ? #6;"(     ( b(     (   b  ( b  (";
XL 670 ? #6;"((  ( bb  (b((  (  (  (b(";
ZO 675 ? #6;"((  (((((b(  (    (  (  (  (";
ZB 680 ? #6;"((  (  (bb(  (  (((((((b(";
EM 685 ? #6;"(  b(  bb((  ( b  (    (  (";
OR 690 ? #6;"((  ((((       (  (  (b(b(((";
RA 695 ? #6;"((  ((b(  (       ((( bb  (";
KI 700 ? #6;"(     bbb  ((   b  b  ((  (";
```

```
HV 705 ? #6;"(((((((((((((((((((((((";
KM 710 MC=2:MR=7
EE 715 AA(1)=3:AA(2)=11
HV 720 AA(3)=3:AA(4)=14
MF 725 AA(5)=4:AA(6)=16
JR 730 AA(7)=4:AA(8)=20
UZ 735 AA(9)=9:AA(10)=10
BN 740 AA(11)=13:AA(12)=20
GA 745 AA(13)=13:AA(14)=22
LT 750 AA(15)=14:AA(16)=17
PM 755 AA(17)=16:AA(18)=17
FI 760 AA(19)=18:AA(20)=10
GR 765 AA(21)=18:AA(22)=12
JE 770 AA(23)=18:AA(24)=22
UK 775 AA(25)=11:AA(26)=7
WB 780 AA(27)=1:AA(28)=19
OA 785 AA(29)=16:AA(30)=19
LT 790 AA(31)=18:AA(32)=17
JP 795 AA(33)=10:AA(34)=16
RE 800 AA(35)=18:AA(36)=19
IY 805 FOR X=1 TO 36 STEP 2
UP 810 POSITION AA(X),AA(X+1):? #6;"▜"
MJ 815 NEXT X
FC 820 POSITION MC,MR:? #6;CHR$(171):C=MC
   :R=MR
UP 825 GOSUB 835:GOSUB 840:GOSUB 845:GOSU
   B 850
TQ 830 GOTO 65
DU 835 POSITION 2,1:? #6;MEN:RETURN
DC 840 POSITION 7,1:? #6;LV:RETURN
JP 845 GD1=CT^0.05:POSITION 12,1:? #6;CT:
   RETURN
IO 850 CN=LV+2:POSITION 16,1:? #6;CN:RETU
   RN
RZ 855 REM INTRO-TEXT 860 915
JR 860 GRAPHICS 0:SETCOLOR 2,0,0
QB 865 ? "While on your way home from a s
   pot of "
CK 870 ? "Galactic Piracy you notice your
    Fuel     "
DG 875 ? "Gauge is flashing  EMPTY .Getti
   ng out "
AM 880 ? "a copy of the local G.S Map (1
   inch      "
FJ 885 ? "to 10,000 Light Years) you find
    nearby "
IZ 890 ? "a planet which mines the Crysta
   l Fuel  ":? "needed to get you home.Wi
   th your cash "
QJ 895 ? "as low as your fuel the Crystal
   s will "
KI 900 ? "have to be borrowed!.The miners
    have    "
IV 905 ? "noticed adrop in Crystals found
    ,so    "
WX 910 ? "have installed some security de
   vices! "
LT 915 ? " .......Pity you don't know....
   ... "
ZB 920 RESTORE 1025
DJ 925 POKE 106,PEEK(106)-16
RF 935 P=148
MI 940 CH=P*256
YW 945 N=64
XD 947 IF PEEK(148*256+8)=60 THEN 990
AV 950 FOR A=1 TO N
TX 955 READ B
DQ 960 C=CH+(B*8)
NY 965 FOR D=0 TO 7
UQ 970 READ E
EC 975 POKE C+D,E
ER 980 NEXT D
EC 985 NEXT A
YJ 990 ? "     Move Joystick to continue."
   ;:POKE 755,1
QA 995 FOR T=1 TO 20:GOSUB 1015:NEXT T
WY 1000 POSITION 20,4:? "        "
UT 1005 FOR T=1 TO 20:GOSUB 1015:NEXT T
LC 1010 POSITION 20,4:? " EMPTY ":GOTO 99
   5
RI 1015 JS=STICK(0):IF JS<15 THEN 60
AF 1020 RETURN
QL 1025 DATA 0,0,0,0,0,0,0,0,0
LZ 1030 DATA 1,60,24,24,24,24,24,60,102
GL 1035 DATA 2,60,24,24,60,102,0,0,0
GF 1040 DATA 3,60,24,24,60,102,0,0,0
TV 1045 DATA 4,8,24,16,74,36,145,36,149
XH 1050 DATA 5,0,24,36,90,189,90,36,24
YO 1055 DATA 6,12,25,51,255,255,54,31,62
XN 1060 DATA 7,73,146,41,84,170,73,212,37
AD 1065 DATA 8,255,255,62,60,28,124,255,2
   55
ZY 1070 DATA 9,0,112,56,24,24,56,112,0
ES 1075 DATA 10,0,3,70,254,70,3,0,0
UF 1080 DATA 11,24,44,74,126,102,90,73,73
NS 1085 DATA 12,24,52,82,126,102,90,146,1
   46
UI 1090 DATA 13,24,36,66,126,102,90,36,36
IN 1095 DATA 14,0,0,0,0,0,24,24,0
MH 1100 DATA 15,0,6,12,24,48,96,64,0
LS 1105 DATA 16,0,60,102,110,118,102,60,0
BB 1110 DATA 17,0,24,56,24,24,24,126,0
PB 1115 DATA 18,0,60,102,12,24,48,126,0
CL 1120 DATA 19,0,126,12,24,12,102,60,0
KE 1125 DATA 20,0,12,28,60,108,126,12,0
MU 1130 DATA 21,0,126,96,124,6,102,60,0
YJ 1135 DATA 22,0,60,96,124,102,102,60,0
TH 1140 DATA 23,0,126,6,12,24,48,48,0
PK 1145 DATA 24,0,60,102,60,102,102,60,0
IY 1150 DATA 25,0,60,102,62,6,12,56,0
EQ 1155 DATA 26,0,0,24,24,0,24,24,0
CL 1160 DATA 27,0,0,24,24,0,24,24,48
EU 1165 DATA 28,135,143,156,248,248,28,15
   ,7
MW 1170 DATA 29,255,255,102,102,102,102,2
   55,255
FD 1175 DATA 30,225,241,57,31,31,56,240,2
   24
UC 1180 DATA 31,0,60,102,12,24,0,24,0
UW 1185 DATA 32,62,62,107,107,107,107,255
   ,255
KL 1190 DATA 33,0,24,60,102,102,126,102,0
XN 1195 DATA 34,24,60,110,126,118,102,126
   ,60
HX 1200 DATA 35,0,56,100,96,96,96,100,56
CK 1205 DATA 36,0,120,108,102,102,108,120
   ,0
HU 1210 DATA 37,0,126,96,124,96,96,126,0
AE 1215 DATA 38,0,126,96,124,96,96,96,0
UN 1220 DATA 39,0,62,96,96,110,102,62,0
TL 1225 DATA 40,0,102,102,126,102,102,102
   ,0
NE 1230 DATA 41,0,126,24,24,24,24,126,0
CC 1235 DATA 42,0,6,6,6,6,102,60,0
BD 1240 DATA 43,0,102,108,120,120,108,102
   ,0
KW 1245 DATA 44,0,96,96,96,96,96,126,0
WB 1250 DATA 45,0,99,119,127,107,99,99,0
HY 1255 DATA 46,0,102,118,126,126,110,102
   ,0
GR 1260 DATA 47,0,60,102,102,102,102,60,0
OM 1265 DATA 48,0,124,102,102,124,96,96,0
TN 1270 DATA 49,0,60,102,102,102,108,54,0
DP 1275 DATA 50,0,124,102,102,124,108,102
   ,0
SZ 1280 DATA 51,0,60,96,60,6,6,60,0
XA 1285 DATA 52,0,126,24,24,24,24,24,0
YB 1290 DATA 53,0,102,102,102,102,102,126
   ,0
IR 1295 DATA 54,0,102,102,102,102,60,24,0
SK 1300 DATA 55,0,99,99,107,127,119,99,0
GU 1305 DATA 56,0,102,102,60,60,102,102,0
FX 1310 DATA 57,0,102,102,60,24,24,24,0
FI 1315 DATA 58,0,126,12,24,48,96,126,0
EB 1320 DATA 59,0,30,24,24,24,24,30,0
HC 1325 DATA 60,0,64,96,48,24,12,6,0
CC 1330 DATA 61,0,120,24,24,24,24,120,0
LO 1335 DATA 62,0,8,28,54,99,0,0,0
JS 1340 DATA 63,0,0,0,0,0,0,255,0
```

HOW TO TYPE IN THE LISTINGS
and get them right!

The program listings in PAGE 6 are prepared carefully to ensure that they can be typed in as easily as possible. Before typing any listings ensure that you are familiar with the use of the Shift and CONTROL and INVERSE keys as outlined in your computer manual. The listings are prepared to match exactly what you see on screen. Every character that you may see in a listing is included in the chart below for cross reference. By using TYPO 3 you can ensure that you type in the programs EXACTLY as they are printed. Remember a single typing mistake may mean a program will not run.

WHAT ARE THOSE CODES?

Each line of a program printed in PAGE 6 begins with a special two letter code. THESE SHOULD NOT BE TYPED IN. They are used by the program TYPO to check that you have typed each line correctly. IF YOU HAVE NOT ALREADY TYPED IN THE TYPO 3 LISTING PLEASE DO SO NOW. The program can be used as you type in each line of a program or to check an already typed program. The code for each line will match but if you have problems check the listing conventions below carefully, you are most probably typing a CONTROL character incorrectly. TYPO 3 cannot check if a line has been missed so if you have problems in running a listing count the lines in the program and ensure none are missing. If the TYPO codes match and the program still does not run, LIST it to cassette or disk using LIST 'C:' or LIST 'D:filename', switch off the computer, re-boot and then ENTER the program using ENTER 'C:' or ENTER 'D:filename'. Save this version in the normal way.

HOW TO USE TYPO 3

1. Type in the listing carefully for although you can use TYPO 3 to check itself (see 6 below) it may not work if you have made mistakes.

2. SAVE or CSAVE a copy of the program.

3. Each time you want to type in a program listing RUN TYPO 3 first. The program will install a machine code routine in memory and then delete itself. Now type in a line as shown in the magazine excluding the first two letter code and press RETURN.

4. A two letter code will appear at the top left of your screen. If this code matches the one in the magazine carry on and type the next line. Note, the code will not match if you use abbreviations. If you prefer to use abbreviations LIST the line you have just typed, move the cursor to that line and press RETURN. The code should now match.

5. If the code does not match, use the editing keys to correct the line and press RETURN again. Repeat if necessary until the codes match.

6. To check a line you have already typed LIST the line, place the cursor on that line and press RETURN.

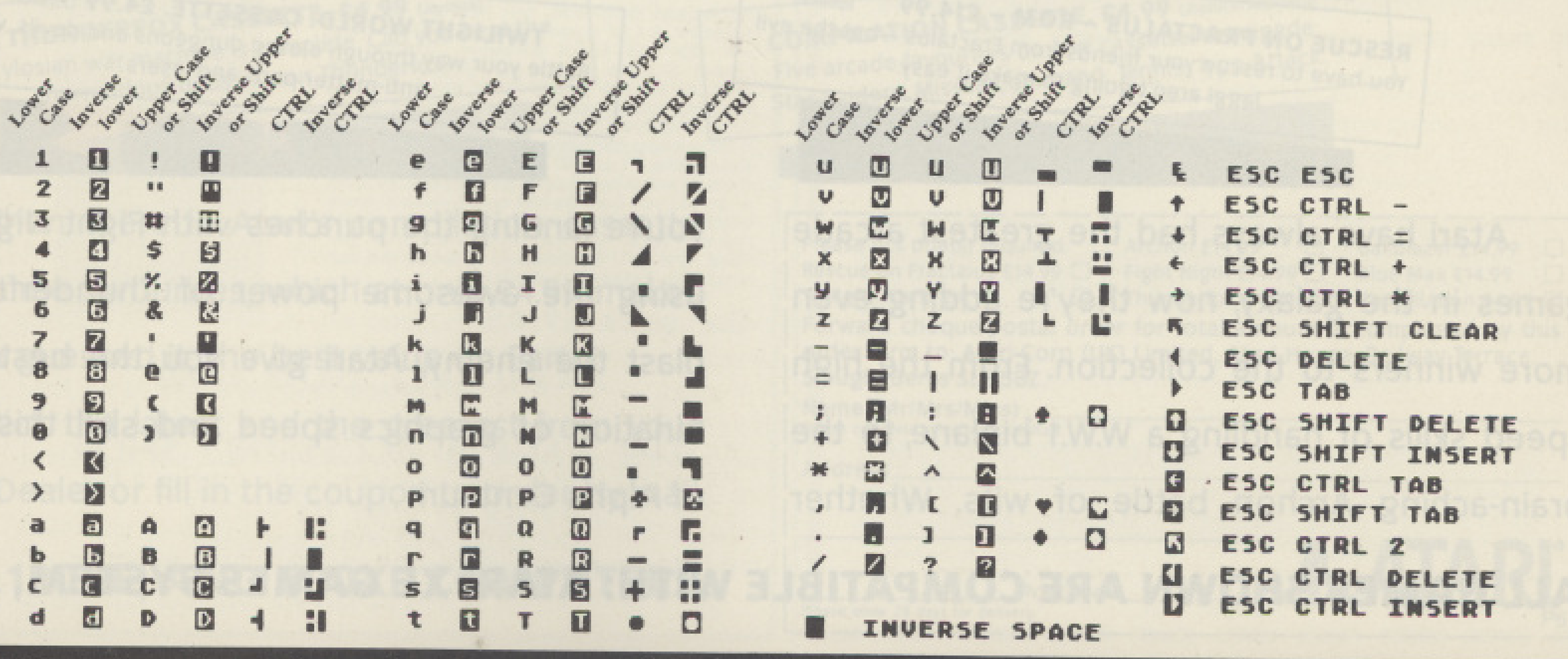
7. When you have finished a listing just SAVE or CSAVE it in the normal way.

You can type in a program without using TYPO 3 and then check it by SAVEing or CSAVEing a copy of the program, running TYPO 3 and then LOADing or CLOADing your program and proceeding as in step 6 above.

Always SAVE or CSAVE a program before running it and always use TYPO before telling us that a program will not run.

OUR UNIQUE LINE BY LINE CHECKER WORKS ON ALL ATARI XL/XE and earlier 8-bit machines

```
EI 1 REM ********************************
AL 2 REM *  TYPO III by Alec Benson     *
         *          June 1985           *
IL 3 REM * A proofreader for PAGE 6     *
         *    based on TYPO II          *
         * published by ANTIC magazine *
EL 4 REM ********************************
SG 100 GRAPHICS 0
WG 110 FOR I=1536 TO 1791:READ A:CK=CK+A:
   POKE I,A:NEXT I
CG 120 IF CK<>30765 THEN ? "Error in DATA
    statements - Check Typing":END
YM 130 A=USR(1536)
VT 140 ? :? "TYPO III is up and running":
   NEW
MA 1000 DATA 104,160,0,185,26,3,201,69
HG 1010 DATA 240,8,200,200,200,192,36,208
QB 1020 DATA 242,96,200,169,79,153,26,3
RK 1030 DATA 200,169,6,153,26,3,162,0
RR 1040 DATA 189,0,228,157,79,6,232,224
TO 1050 DATA 15,208,245,169,93,141,83,6
KC 1060 DATA 169,6,141,84,6,173,4,228
EU 1070 DATA 105,0,141,95,6,173,5,228
BK 1080 DATA 105,0,141,96,6,169,0,162
KK 1090 DATA 3,149,203,202,16,251,96,0
ZR 1100 DATA 0,0,0,0,0,0,0,0
LD 1110 DATA 0,0,0,0,0,0,32,94
JM 1120 DATA 6,8,72,201,155,240,55,230
TV 1130 DATA 203,133,209,138,72,169,0,133
TW 1140 DATA 208,162,8,10,38,208,6,209
MF 1150 DATA 144,7,24,101,203,144,2,230
RL 1160 DATA 208,202,208,239,133,207,24,1
    65
TM 1170 DATA 204,101,207,133,204,165,205,
    101
AW 1180 DATA 208,133,205,165,206,105,0,13
    3
XH 1190 DATA 206,104,170,104,40,96,138,72
NR 1200 DATA 152,72,162,0,134,207,134,208
GF 1210 DATA 160,24,6,204,38,205,38,206
EA 1220 DATA 38,207,38,208,56,165,207,233
TM 1230 DATA 164,170,165,208,233,2,144,4
SK 1240 DATA 134,207,133,208,136,208,227,
    162
CB 1250 DATA 8,165,207,133,204,165,208,6
XN 1260 DATA 204,42,201,26,144,4,233,26
MB 1270 DATA 230,204,202,208,242,133,205,
    169
BC 1280 DATA 128,145,88,200,192,40,208,24
    9
WV 1290 DATA 165,204,105,160,160,3,145,88
QA 1300 DATA 165,205,24,105,161,200,145,8
    8
MQ 1310 DATA 32,69,6,104,168,76,153,6
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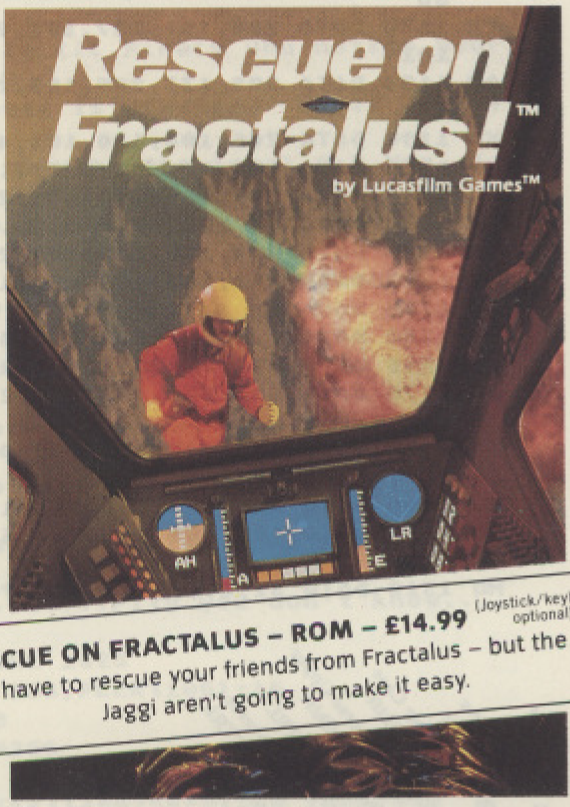
THE LATEST AND



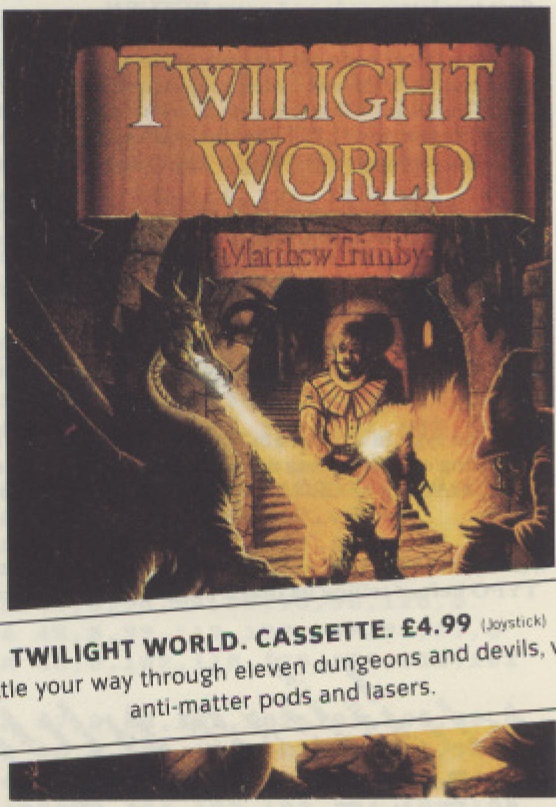
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In the exciting May issue of *Atari User* you will find:

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- Mine Runner – Fast-action excitement in an abandoned mine in this arcade-type game.
- All the latest software releases: Zybex, Thunderfox, Winter Olympiad and Super Soccer.
- Our resident adventurer Rouloc gives you some help in the Dungeon.
- A full colour map of the subterranean world of the Eidolon.
- All your programming problems answered by our technical wizard.
- More help with Atari Basic in the latest article in our easy programming series.
- Having tape saving problems? This easy-to-use routine could be the answer to your prayers.
- Check out those ups and downs in your life with our exciting Biorhythms program.
- We take an in-depth look at how Atari Basic tokenises program lines and we also give you a routine to view the finished results.
- Tynesoft under the microscope – we talk to the company who created Olympiad '88.

All major listings in this issue are accompanied by checksums to help overcome typing mistakes.

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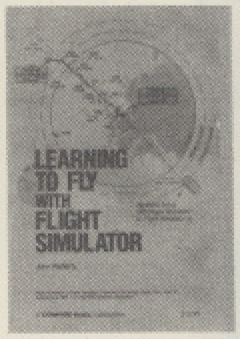
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PAGE 6 AWARDS

Many thanks to all of you who voted in the PAGE 6 AWARDS. Putting it all together was not easy as the votes were extremely widespread with the result that most of the lower places were tied and there were some extremely close fought battles for the top spot in most categories.

The least closely fought category was for **Best Serious Software** on the 8-bit where **Mini Office II** was a runaway winner, indicating that there is an interest in using the 8-bit micros seriously if only software publishers would take note.

The **Best Article/Program in PAGE 6** was, once again, very widely spread with your votes indicating the wide spread of interest which PAGE 6 continues to support. Almost all of the articles or programs published during the year received votes but the top three were well ahead of the field although very closely fought between themselves. The 'commercial' categories for **Best Software** were very intersting, we really didn't know what to expect. Your votes were extremely widely cast indicating just what a breadth of interest there is amongst the PAGE 6 readership. Several of you got a bit confused and included program listings from PAGE 6 in the commercial categories and they got more votes than some commercial software! Just goes to show you how good the program listings are!

The two categories which caused the most interest and for which your views were eagerly awaited were for the Company/Person who had done the Most or Least to Support Atari during 1987. Your votes for the **Company to have Most Supported Atari** were overwhelmingly for **Red Rat Software**, a just reward for a small company that has stuck with Atari while others have gone off to other pastures. Let's hope that your votes will encourage Red Rat and other small companies to keep supporting Atari. If you can back up your votes with your money, we are sure that the support will come from these companies. Second in this category was PAGE 6 (thank you) and amongst the other honourable mentions were Software Express, U.S. Gold, Mastertronic, Jeff Minter, S.S.I., Ken Ward (knowing Ken, he probably voted for himself!) and even some guy called Jack Tramiel!

Heading the votes for the **Company to have done the Least to support Atari** in 1987 were **Atari** themselves which goes to indicate that, in the minds of existing Atari owners, Atari still haven't got their marketing right. Atari owners tend to be a very dedicated and loyal bunch and criticism is generally borne out of frustration that Atari don't do more to support themselves and their users. Close runner up in this category was John Lawson of Computer Support. Atari owners don't like being ripped off and have long memories. Wherever John Lawson is hiding, he ought to stay there! The best vote in this category came from the guy who voted for 'The Wife'! We won't publish his name otherwise he'll get even less support next year!

Anyway we said we would get £25 to spend on software off to three of the lucky votees so our super sophisticted selection technique (stick in a hand and grab one!) pulled out the following lucky winners. Graham Stewart from Dublin, Gwyn Fisher from Taunton and D. Naylor from Coulsdon, Surrey. The cheques are in the post as they say!

BEST ARTICLE/PROGRAM IN PAGE 6

MJDBASE

Runners up: First Steps and Solid Modelling

BEST ATARI 8-BIT ARCADE GAME

DRUID

Runners up: Arkanoid and Gauntlet

BEST ATARI 8-BIT ADVENTURE STRATEGY GAME

SILENT SERVICE

Runners up: The Pawn and Alternate Reality (The Dungeon)

BEST ATARI 8-BIT SERIOUS SOFTWARE

MINI OFFICE II

Runners up: Print Shop and Synfile

BEST ST GAME

BARBARIAN

Runners up: Flight Simulator II and Terrapods

BEST ST SERIOUS SOFTWARE

FLEET STREET PUBLISHER

Runners up: Fast Basic and Degas Elite

COMPANY TO HAVE DONE THE MOST TO SUPPORT ATARI

RED RAT SOFTWARE

COMPANY TO HAVE DONE THE LEAST TO SUPPORT ATARI

ATARI

The PRINTER JUNGLE

With so many different types of printer around, how do you go about making the right choice?

Who needs a printer? The answer is quite simply everybody. Whether you use you Atari for programming, word processing, record keeping or even just playing games you will find a use for a printer. Applications such as word processing, of course, demand a printer and any sort of record keeping will be fairly limited unless you can get hard copy. Programmers will find that de-bugging programs will be much easier with a printed listing but what about those games players? Well, several games, particularly adventures, do have some printer support and you can always try and get a graphics dump of that high score screen. So you see everybody could use a printer.

Deciding to add a printer to your system is easy but the next step will be the most difficult hardware decision you will ever have to make. The choice of printers is overwhelming and no magazine article could possibly cover all of the printers available. What we can do is select several different types of printer ranging from Atari's own models to Epsons and the like and explain the advantages and disadvantages of each so that you will be better armed when you come to make your decision. In the end it will be *your* decision for what looks good on paper is purely subjective. One thing to come to terms with straight away is that you will never get it quite right because technological advances mean that you will always be looking for the greener grass. You will have to get as near as you can and be satisfied!

Printers come in all price brackets but we will deliberately keep our survey confined to the sort of printers that most owners can afford. If you want to spend £1000 on a printer then you probably know exactly what you want, or at least you should do!

WHAT DO YOU WANT IT FOR?

The best starting point is to write down all of the applications you are likely to have for a printer. Do you just want to dump out program listings for checking? Do you want to write letters? If so, are they going to be to understanding friends or to the bank manager asking for a loan? Do you need graphics? Bear in mind that graphics are not just pretty pictures as most of the currently available desk top publishing systems use graphics dumps for their final output. Work out what you really need a printer for and then you can decide what type of printer you need. None of the affordable printers will give *true* letter quality *and* graphics so choose with care.

LETTER QUALITY OR DOT MATRIX?

The first thing that confuses almost all new purchasers is 'letter quality'. Almost all manufacturers advertise their printers as having a 'letter quality' feature when in fact all they mean is that they have different print styles, some of which are better than others! True letter quality, to accepted business standards, is only available from a printer with a daisy wheel or print thimble and, with one exception for lucky XL/XE owners, these don't come cheaply. If you need professional, formal, documents that are designed to impress then you need a letter quality printer. These are ideal for business to business letters, formal reports or college theses but beyond that a true letter quality printer has very little

THE MYTH OF EPSON COMPATIBILITY

One of the biggest probems faced by the prospective printer purchaser is the myth of 'Epson Compatible'. Unfortunately, if you want a printer that is 100% Epson compatible you have little choice but to buy an Epson!

At its lowest level 'Epson compatibility' simply means that the printer uses the same control codes for its major functions as the Epson so, for example, if you send ESC P the printer will switch to pica characters. Fine for word processing but problems often begin when graphics are required. Most printers will support Epson graphics commands to some extent but many do not and there is no easy way of telling unless you have access to both an Epson manual and the manual for your printer. The third party manufacturer who strives for Epson compatibility will often support sevberal of the graphics modes but seldom every one. Some of those Epson modes are so obscure that other manufacturers will think they can safely leave them out. This is fine until a program like Fleet Street Publisher comes along which, in its first version, used an obscure graphics mode found only on the Epson FX series. It was not even compatible with other Epson models so there was no chance of it working on another manufacturers Epson 'clone'! Fleet Street has now been extended and works on most Epson compatibles but the first version served to graphically illustrate the problems which can arise.

A good example is the Kyocera laser printer which has an Epson emulation mode and also has, rather handily, a full feature comparison in the manual. Out of 72 Epson features, 15 are missing. Most are inconsequential such as the bell, and paper end detector but if, for example, your program downloads a character set or uses 9-bit bit image graphics, you have had it. A closer look, and one that is not obvious at first sight, is that the 8-bit bit image mode supports only 4 of the Epson's 7 possibilities and guess which Fleet Street used?

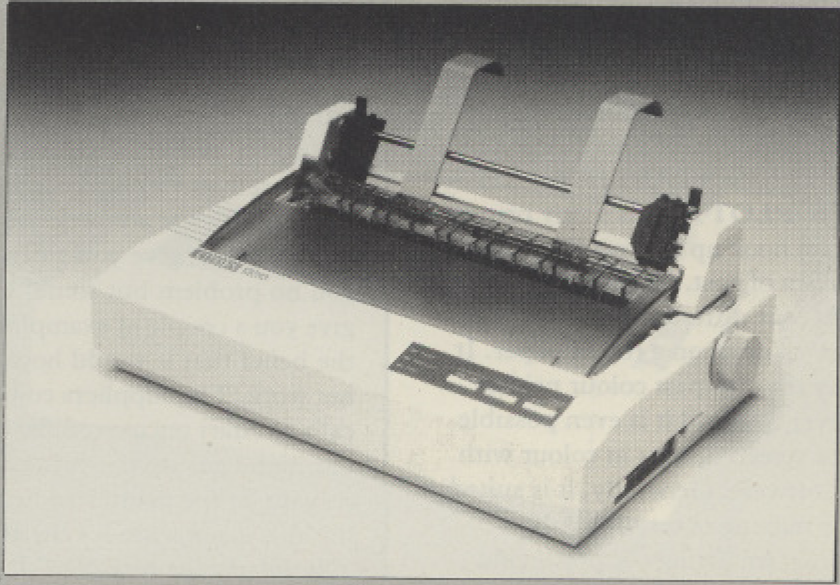
The above highlights the problem and there is no easy answer other than to try and test your prospective printer with the software you are using or buy from a good Atari dealer who should have already tested compatibility. If you buy discount you have little chance of doing this but a reputable authorised dealer should be willing to allow you to try a printer out if you have any doubts.

Epson compatibilty really only means 'compatibilty to a degree'. How much of a degree depends on the individual manufacturer.

READER REPORT

Citizen 120D

Andy Hunter gives a personal report on his Citizen printer



There are many printers to choose from, and finding one that suits you can leave you with a headache, feeling dizzy, or even both! The printer I am using is the Citizen 120-D. It can print in draft mode at 120 characters per second or at 25 characters per second in NLQ mode. Along with the printer you get a 184 page spiral bound manual, a serial interface and a tractor feed unit.

Many printers claim to be Epson compatible and as far as I have been able to test, the Citizen is justified in doing so. It is also IBM compatible. On the right hand side of the printer there is an interface 'drawer' which slides out to reveal 8 DIP switches. By using these, you can configure your printer to act like any one of the three FX printers or an IBM graphics printer. An added bonus which the Epson FX range does not have is the ability to print in reverse (black on white). You also have dot addressable graphics in six densities.

There are 11 international character sets built in to choose from, with accented characters as well as line and block graphics. You can print in expanded, compressed, emphasized and double strike print plus subscript, superscript and italics. Another useful feature that you can use is the hex dump feature which not only prints the hexadecimal value of every code received, but also prints all the corresponding characters and the control code abbreviations.

There are two built in self tests. A comprehensive printer self test prints all of the 120-D's standard characters, plus line block graphics and accented characters and the maintenance self test identifies the version of control program and character generator and performs a printer alignment test.

On top of the printer, to the front there are three switches and three lights. These switches are for the ON LINE, LINE FEED and FORM FEED (auto sheet load), the lights are for POWER, PAPER OUT and READY. The manual gives you a step by step run through of all the features. There are nine chapters and six appendices plus a four page quick reference guide.

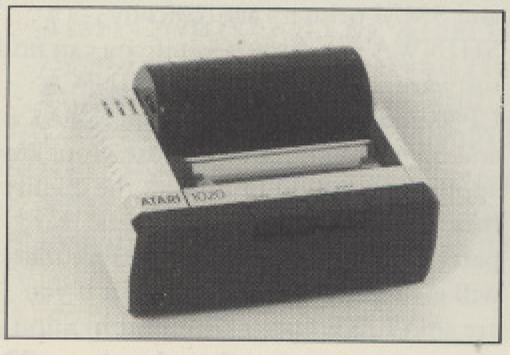
As stated, the DIP switches are in an interface 'drawer' cartridge, which makes things easy when you want to access the switches. Into this cartridge you plug in your interface if needed. The printer buffer holds about 4K of data at a time, though I believe this can be upgraded.

The price of the printer is also an added feature, depending where you buy it of course. You can get it for as little as £150.00 and upwards, with a two year warranty. A new ribbon costs about £3.50 and will print around 2,000,000 characters and the print head will last for 100 million characters before replacement. Both operations are very simple to perform. You don't even need a screwdriver!

The Citizen 120-D is a fair little machine. I have had no problems using Printshop, Typesetter, Rubber Stamp, Print Wiz or any of the various word processors. The printer is in constant use and I certainly consider it good value for money.

use. No graphics, no print enhancements other than underlining and whilst you could get away with doing program listings the time taken may not be justified. Unless you spend a lot of money these printers are slow.

Dot matrix is the most popular choice but the print quality varies considerably, from the budget end such as the Atari 1029 up to classy 24 pin printers which can give exceptional results. In most cases a dot matrix printer will enable you to have different styles such as bold,



emphasised, double strike etc. with different fonts as well as graphics in one or more densities. Something to bear in mind is that connecting a printer to your Atari does not automatically mean that all of its features will be instantly available, graphics for example depend on software and if you happen to buy a printer for which there is no software support, you won't get graphics unless you can decipher the manual and write a program yourself!

CONNECTING IT UP

One aspect of buying a printer that is often overlooked is that you must connect the printer up to your Atari. XL/XE owners who stick to Atari brand printers have the advantage here as the printer will come complete with the necessary built-in interface and cable and you simply plug in and go. The fact that the 8-bit interface is built in makes most of the Atari printers, with the exception of the SMM804, unsuitable for ST owners.

The ST has a built in Centronics port so that, in theory, all you need is a standard Centronics cable to connect your printer. In practice it is not always that easy for the ST is not a 'standard' machine and there are several printers that will not work without modification as you will read elsewhere in this feature.

If you want to use a third party printer with the XL/XE then you will need some sort of interface which will add between £30 and £70 to the price of your printer so bear this in mind when looking for those 'bargains'.

LET'S START WITH ATARI

The most logical place to look for a printer for your Atari system is with the

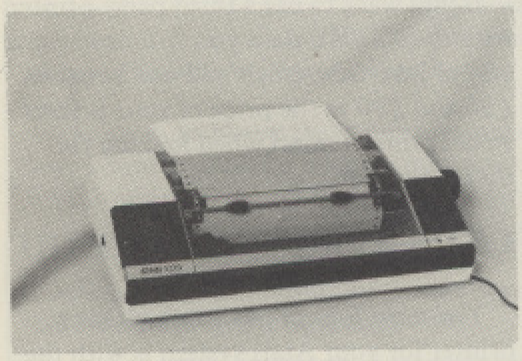
Atari brand but only one of these printers is suitable for the ST, so if you are an ST owner you might like to skip a few paragraphs while we discuss the models which are available to XL/XE owners. Let's start with the smallest, and possibly cheapest, printer you are ever likely to find. The **ATARI 1020 PRINTER/PLOTTER** is a tiny printer that you can hook up to your XL/XE for the minimum of cost. It is unusual in that it uses four different coloured 'ball point pens' to draw on a roll of paper. It is certainly the cheapest colour printer you will ever find and it is even possible to produce screen dumps in colour with the right software. Generally, it is suited mainly for making notes, doing 40 column program listings or producing simple drawings. You may be able to write to understanding friends but if you want to write to the bank manager a hand written letter would probably be better! Unfortunately there is no commercial software that supports this printer but several magazine listings have appeared enabling you to have 80 column printout, do graphics dumps, design cassette inlays and more. You will probably get a second hand 1020 quite cheaply nowadays and it is a good starter although you will probably end up with a more versatile printer. One point to bear in mind is that the paper rolls and replacement pens are not easy to find (try Tandy's as they produce a similar printer).

If you have decided that you want true letter quality, the much maligned **ATARI 1027** may serve you well. The quality is not quite what you would expect from a more expensive daisy wheel printer but is perfectly adequate for most people's requirements. Bear in mind that, at a little over or under £100, this is the cheapest letter quality printer ever made and if you want to do comparisons you will be talking about a printer costing at least £300 and, more likely, around £600. If you look after it, the 1027 will give you excellent service. It takes single sheet paper and gives typewriter style quality using a print thimble. You will be able to produce very acceptable quality letters but the only enhancement is underlining. You could conceivably use it for program listings but you may well be up all night changing the paper, it is *very* slow! Again you should be able to pick up one second hand at a very reasonable price but try and get a sample print out first as several models suffered from a fault that produces print in quite noticeably 'wavy' lines.

If you have decided that you need a dot matrix, and have only a limited budget, then the **ATARI 1029** will be the obvious choice but be warned that it *is* a budget printer and the quality is not what you would expect from an Epson or the like. Commercially, just about the only software to support the 1029 is 10-PRINT and many owners have been disappointed to find that well known programs such as PRINT SHOP will not run on the 1029. The reason that the printer is not widely supported is that it has only 7 print head pins instead of the standard 8 or 9 pins and prints in a 7 × 5 grid as opposed to the more usual 8 × 8. Programs such as PRINT SHOP which have been written to support 8 × 8 matrix printers can be fairly easily adapted to suit other 8 × 8 printers but adapting to a 7 × 5 matrix would require major re-writing. Due to the fact that this printer was never on sale in the States, software support from American companies is never likely to appear. So what is the 1029 useful for? It is ideal for program listings, and with programs such as those published in Issue 25 of PAGE 6 you will be able to get inverse and control characters as well as different fonts. Several graphics dumps have been published and with programs like 10-PRINT or the FONT IV ROM chip from Datel Electronics you will produce reasonable quality letters and reports, but don't expect miracles. The 1029's chief attraction is its price and it will serve you well if your needs are limited.

Atari's top of the range dot matrix printer is the **XMM801** and ST owners can rejoin us here for the **SMM 804** is identical. The only difference is the 8-bit interface built into the XMM801. For the first time you will get a wide choice of print style with Pica, Elite, Condensed, bold, double strike, double width, italics, subscript and superscript readily available by adding a few commands to your documents. On the ST you will also get screen dumps by using the Alternate-Help key combination and most commercial software will, or should, have a driver included for this printer. The XL/XE owner is more limited but will be able to access most features although graphics dumps may prove a problem. The XMM and SMM printers are basically SHINWA's in disguise so if you can find software that supports the SHINWA CP80 you should be okay. The XMM and SMM can be used for just about any application but, to be honest, the quality is not that high. There are several third party printers for only a little more that will give much better results but if you are an XL/XE owner then bear in mind

continued on page 22



ST (IN)COMPATIBILITY

One of the great selling points of the ST is that all of the necessary interfaces, including Centronics Parallel, are built in so that all you need to do, in theory, is to buy a standard Centronics printer and a cable and plug it in. That's the theory but in practice it doesn't always work like that.

The ST is NOT a standard machine as far as many printer manufacturers are concerned and several printers will need to be modified to work with it. Some may not work at all while others, such as the NEC P2200, will work to an extent but will often give you garbage at critical moments. A standard Epson will give you no problem but some 'Epson compatibles' may need to be modified. Let's give you a couple of examples. A while ago we bought a Kyocera Laser printer in the belief that it would hook up to the ST without problem. Not so, it just did not work. The suppliers could not work out what was wrong until several frantic calls to Atari uncovered the information that the power output from the ST was too high causing the printer to 'cut off' as soon as it received data. A 1kOhm resistor in the printer had to be changed to 10kOhm which cured the problem but this is not a job for the average user.

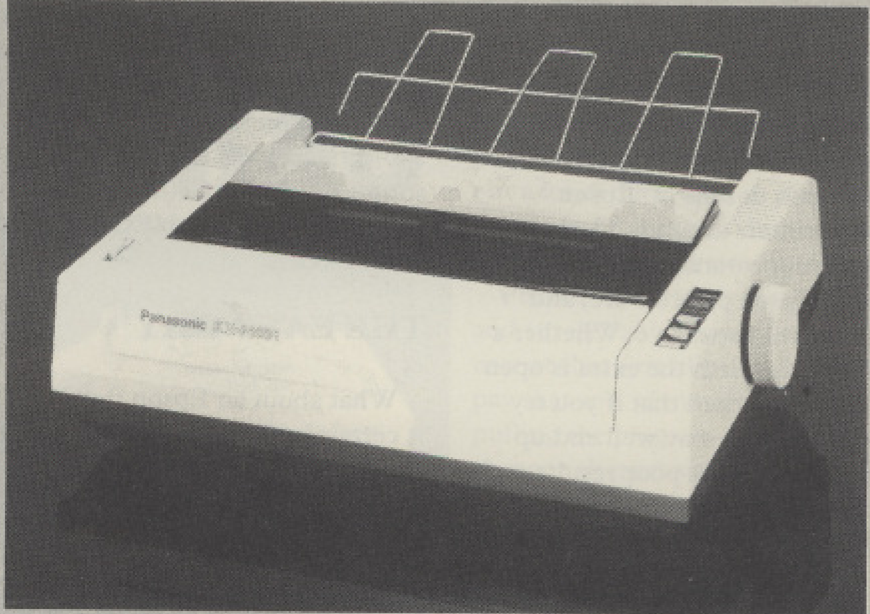
Similarly the new NEC P2200 does not work properly unless modified. NEC are aware of the problem which, they say, is due to the strobe signal on the ST not being standard. The fix is an upgrade to the firmware of the printer and a new wire link on the PCB, again not a job for the ordinary user. Authorised NEC dealers have been appraised of the problem and will modify the printer if you tell them you want to run it with an ST but if you buy discount you could face major problems.

These are just two examples and there are probably others. We would like to hear from those who have had similar problems. Whatever printer you buy, tell the company you buy from that you want it to run with an ST and ask for an assurance that the printer will do so. At least then you have the chance of getting your money back or a modification at no cost.

READER REPORT

The Panasonic KX-P 1081

J.E.Robinson tells you about his Panasonic



The decision to upgrade from my 1027 to a more expensive, preferably Epson compatible, NLQ, Dot Matrix machine was not taken lightly. A special offer tipped the balance, and the change was made. Never have I regretted so much the hesitation over spending the extra few pounds! This machine really is something special.

The package deal (from Compumart) included the Printer at £178.25, a Centronics Interface for the XL/XE at £39.00 with ATARIWRITER PLUS thrown in free. The printer included a generous length of cable, with no plug, but everything else was ready to boot up, even the dip switches on the Interface, and those inside the printer, were pre-set and ready to go although the advice, printed on the front cover of the Instruction Book, to read the manual completely, should be heeded.

The manual is ring bound, and is easy to read and understand. It is comprehensively indexed and laden with every possible cross reference, even the page numbers are in a format that makes search and locate a doddle. The printer itself is coloured a nice two-tone grey and is a compact, tidy, piece of equipment, small enough to sit happily on a standard home computer desk. The controls are mostly well placed, being a bank of switches at each side. The right hand bank also has three lights to indicate Power On, Paper Error and On Line which indicates when the printer is ready to accept data from the micro. This is coupled to a green switch which puts the printer 'on line' after paper is fed in, for instance. The two other switches are Form Feed, which finds the top of the next sheet, and Line Feed, which moves the paper one line at a time. This last also serves as a 'self test' mode, when used with the on-off switch which causes it to print out the 96 ASCII characters over the full platen width until the power is turned off.

At the left hand side is the Print Mode control, giving the choice of Standard, NLQ or Compressed modes, and the Paper Feed selector, which adjusts the amount of pressure placed on the pinch rollers. This can accommodate single sheet or fanfold paper. Inside the machine, after the two strong covers have been removed, can be found the head gap lever, which adjusts the printing head-platen gap to allow for multi-sheet copying, and eight dip switches.

These are set in the most popular positions before shipping, but can be over-ridden by software commands. The ribbon cassette is easily fitted, and reputed to have a life of 3 million characters in draft mode. The print head itself has a stated service life of 100 million characters. The transformer is built into the machine, which has it's own connector to the mains.

All word processors should work without problem on the Panasonic and for the dedicated enthusiast, or the professional user, the programmable capabilities of the KXP 1081 give the user the choice of over 60 print styles, 10 International Character Sets, emphasised, double strike, subscript, superscript, proportional spacing and a host more that may be programmed into action. Block or line graphics ability are built in by permitting the selection of alternate IBM character sets, and bit mapped graphics can create many special effects, from club or company logos, to artistic images. Software commands, or program commands, can override most of the hardware switched configurations.

Printing speeds are reputed to be 120 cps in draft mode, or 24 cps in NLQ mode. Both, I feel, are decidedly underestimated. Printing is bi-directional, but single direction may be selected, as can half speed printing. Page length may be set by the software, or switched in with the dip switches. Software control is available to skip perforation, set vertical or horizontal tabulation, set a score or more different line spaces, underline, set italics or even delete the last character and there are many more.

The quality of the print is well up to the standard of the rest of the machine. NLQ is written by printing the top part of the line in one direction, and the bottom part on the way back. The result is certainly equal to many a portable typewriter. The KXP 1081 is, arguably, one of the best value printers around.

Companies mentioned in this feature from whom further details may be available.

Atari Corp (U.K.) Ltd, Atari House, Railway Terrace, Slough, Berks. Tel 0753 33344
Epson (U.K.) Ltd., Dorland House, 388, High Road, Wembley, Middx. HA9 6UH. Tel. 0800 289 6222
Panasonic Industrial UK Ltd., 280/290 Bath Road, Slough, Berks SL1 6JG. Tel. 0753 73181
Citizen Europe Ltd., Wellington House, 4/10, Cowley Road, Uxbridge, UB8 2XW. Tel. 0895 72621
NEC Business Systems (Europe) Ltd., 35, Oval Road, London, NW1 7EA. Tel. 01 993 8111
RSD Connections Ltd. P.O. Box 1, Ware, Herts. Tel. 0920 5285
Frontier Software, P.O. Box 113, Harrogate, North Yorkshire, HG2 0BE. Tel. 0423 67140

the cost of that interface if you look elsewhere.

OTHER MANUFACTURERS

Now we start entering the realms of infinite choice! Every computer owner must have heard of Epson but there are also dozens upon dozens of 'Epson compatible' printers around. The major reason for the appearance of all these clones is that Epson printers are, and always have been, expensive. Whether a genuine Epson is worth the extra is open to debate but be warned that if you try and go too cheap you may well end up with a printer that gives poor results and has little software support.

Your choice in third party printers is basically 'Epson compatible or not' and provided that you choose printers with similar features the deciding factor will be whether or not you like the quality of print. Surprisingly it is remarkably different from one make to another. If you are going to commit yourself to any reasonable amount of expenditure on a printer then it essential that you do all you can to get sample printouts from your selected models. Over five years ago I purchased an **NEC 8023** for use in producing the program listings in PAGE 6. The main reason for choosing this model was that I saw a manual someone had produced on it and, to my eye, the result was far superior to the Epson printers. Epson's produce a very square, light, font which I find lacking in quality but, as stated earlier, 'quality' is very subjective. This is why it is essential to compare printouts if you possibly can before making your final choice. The NEC 8023 has been a cracking printer coping with more work than most owners are likely to have in ten or fifteen years. It can do everything that an Epson can do but software support has been sparse and it has been a struggle at times finding programs to support the printer but they have been found (or written) and all of the listings in PAGE 6 have been produced on this printer from the early days. If you buy a 'non-Epson' printer this is one of the problems you may face, you must trade off the subjective appeal against the likely support. The NEC8023 is, alas, no longer available but NEC do produce other models.

THE EASY WAY

What about an Epson then? Well, this is certainly the easiest way out of the jungle, for every commercial program that supports printers will support the Epson. Your ST will dump screens directly to an Epson and the XL/XE has a wealth of public domain programs, magazine listings and commercial software for the Epson. Several models are available and they all have similar features with pica, elite, bold, double-strike, enhanced, excellent super and sub-script, italic and several graphics modes. Epson seem to have a policy of phasing out their printers within a year or so and it is therefore hard to keep up with the various models. Within the price range we are concerned with Epson's current model is the **LX800** with a RRP of £275. It will give you all may need from a dot-matrix and is, naturally, compatible with all the earlier models. You may also come across the GX80, LX80, LX86, FX80, FX85 but these are now out of production and you could have a problem finding spares if you need them. Ribbons etc. will present no problems as they are readily available in view of the large number of these printers in use. The strange thing is that, if you can find an older model you will probably have to pay a lot more than for the current one! There are far too many models to explain in detail and, as stated most are no longer in production. For details of the current models throughout the range (up to £1345!) try and get hold of Epson's incredible catalogue which comes in the form of a magazine called Which Epson. It will give you all the information you need. All you then need is the money!

THE SLIGHTLY MORE DIFFICULT CHOICE

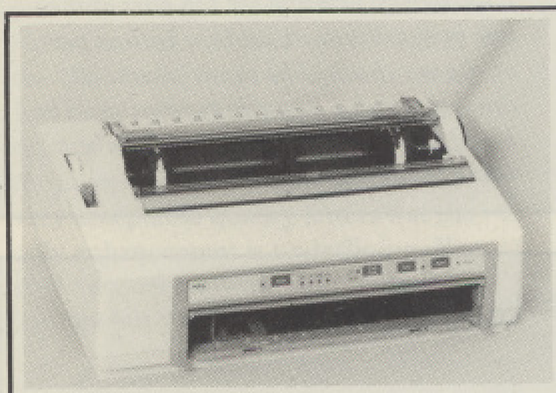
There are dozens of other third party printers that claim to be Epson compatible but it is all too easy to make a mistake. Two of the most popular third party printers which offer excellent value for money are the **CITIZEN 120-D** and the **PANASONIC KXP 1081** which are the subject of Reader Reports elsewhere in this feature and you will not go far wrong if you choose one of these. If you want to get one of the cheaper third party printers, the safest bet is to buy one that you know other owners have purchased, unless you are a true pioneer! That way, at least you can get some help if things go wrong. If you buy from the discount shops don't expect any advice or help if you can't get the printer going, most of them will probably never have heard of an Atari!

THE NEW TECHNOLOGY

The latest innovation in dot matrix printers is the 24 pin print head which can give exceptional results, particularly when used with desk top publishing packages, but until recently these printers have been very expensive and have been beyond the reach of the average user with prices starting at around £600.

NEC have now however introduced an extremely competitively priced 24 pin printer, the **NEC P2200**, at a recommended price of £395 (discount about £100 less) which brings 24 pin technology into the reach of almost everybody. The P2200 is an excellent printer in all respects with super quality print in styles such as Courier, Super Focus, OCR and Souvenir that are not available on lesser printers. In addition, font cartridges can be added for even more variety. All of these fonts can have the usual enhancements and you can even design and download your own fonts. Graphics are well supported and graphics produced text with programs such as Fleet Street Publisher is truly excellent.

The printer is bristling with innovations such as the ability to insert single sheets without taking out the tractor feed paper and having all 'firmware' controls operated by the push buttons on the front rather than having



Before you turn the page, check out all the other parts of this feature about interfaces and compatibility and the like and then make up your own mind. If you don't have a lot of money for a printer, decide what you want the printer to do and buy accordingly. If you bear all the above information in mind you will not amazed at the results and all for a pric that is less than many Epson 9 pin printers!

FOR TOP QUALITY, SELL THE CAR!

The best print available nowadays, outside of true typesetting, is from the much talked about laser printer, but at minimum of #1800 lasers are really beyond the scope of the average user. The Atari laser may look better value b then you have to purchase a Mega ST t go with it!

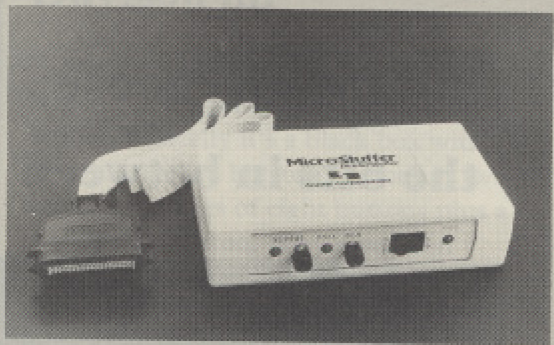
If you are seriously thinking of a laser tread very carefully, it is very easy to make a very expensive mistake (ask us! If you want to consider a laser then the

Graphics from the NEC P2200 using Fleet Street Publisher

Once you have purchased your printer there are many accessories you can add to make use of the printer and communication between your Atari and your printer a little easier. The printer manufacturer will have several accessories such as cut sheet feeders, tractor feeds and the like together with printer buffers and other exotic devices. Before you buy check that the printer does not have such 'optional' extras that are not optional for your needs as these often have an incredibly high price. A cut sheet feeder for an Epson, for example, could set you back around £160, more than the price of another manufacturer's printer!

Add-ons are an area where you can get

EXTRAS



ADD MORE SCOPE TO YOUR PRINTER

stung quite badly and the principal reason is that most of these extras, such as printer buffers and printer sharers, are only normally needed in business. One universal rule seems to be that if you are selling for business use, double the price!

Most owners will not require any extras but a printer buffer is one luxury that, once experienced, you will not want to be without. Likewise, if you are lucky enough to own two printers, a printer sharer is well worth while if you can get it at the right price.

The best value printer buffer, at around £50, is Supra's **MicroStuffer** which gives you 64k of buffer and a unique 'repeat' feature to reprint the data in the buffer as many times as you want. The unit simply plugs into your Atari or an interface and then to the printer. It accepts data from the computer as fast as possible and then stores it prior to sending it to the printer at whatever rate the printer can handle. Your computer is then free to do other tasks while the buffer looks after the printing. Most printers will have a built in buffer but this is often only around 2k and is seldom more than 8k. Older printers may only have a one line buffer! If you print out a lot of data, such as spreadsheets, or regularly do graphics dumps then the MicroStuffer is an excellent time saver.

Printer sharers can cost well over £100 and surely can't be justified for the home user at that sort of price. If you have to pay that sort of money, better to keep pulling the plugs in and out! There are cheaper alternatives, though they are often hard to find. One such device is the **Sunnyline** 2-way unit obtainable from RSD Connections which enables you to connect two printers to one computer and simply switch from printer to printer. At a price of £38, it is not cheap but is a lot cheaper than most of the rest. Other units are available to connect more printers or two computers to one printer.

Look around, there are many such 'goodies' you can add to your printer, if you have the money!

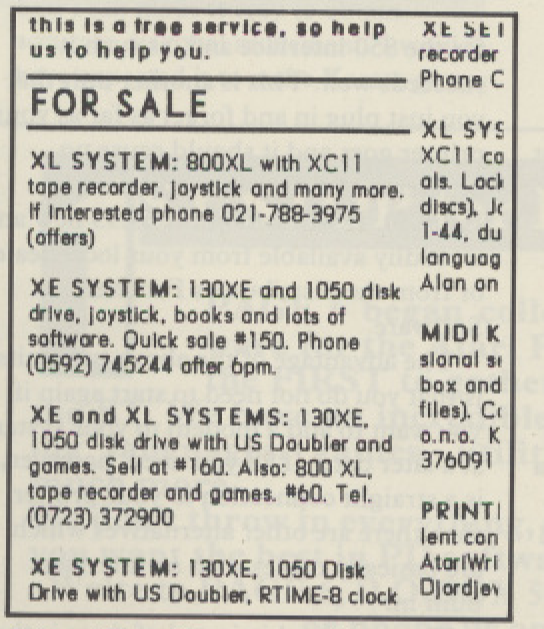
to fiddle about with dip switches. The printer will 'talk through' the various options by printing out a series of questions to which you answer 'Yes' or 'No' by pressing the appropriate buttons. Ingenious, and you don't have to keep finding the manual and a screwdriver!

24 pin printers give a matrix of 360 × 360 dots per inch and you will see claims elsewhere that this is better than laser printers. In theory it is, for most lasers print at 300 × 300 but whereas lasers use minute particles of tone,r a dot matrix achieves its density by overprinting with comparatively hefty pins. The result is not as good as a properly used laser but is infinitely superior to 8 or 9 pin printers and is, in fact, much better than many lasers used in 'emulation modes'. If you need quality or are into desk top publishing forget the rest and get yourself a NEC P2200. You will amazed at the results and all for a price that is less than many Epson 9 pin printers!

FOR TOP QUALITY, SELL THE CAR!

The best print available nowadays, outside of true typesetting, is from the much talked about laser printer, but at a minimum of £1800 lasers are really beyond the scope of the average user. The Atari laser may look better value but then you have to purchase a Mega ST to go with it!

If you are seriously thinking of a laser, tread very carefully, it is very easy to make a very expensive mistake (ask us!). If you want to consider a laser then the only advice we will give you is to buy the Atari DTP system or a Postscript laser but these are expensive. If you buy a laser for the ST which does not support Postscript you will most likely find that there is no software support or that the


this is a free service, so help us to help you.

FOR SALE

XL SYSTEM: 800XL with XC11 tape recorder, joystick and many more. If interested phone 021-788-3975 (offers)

XE SYSTEM: 130XE and 1050 disk drive, joystick, books and lots of software. Quick sale #150. Phone (0592) 745244 after 6pm.

XE and XL SYSTEMS: 130XE, 1050 disk drive with US Doubler and games. Sell at #160. Also: 800 XL, tape recorder and games. #60. Tel. (0723) 372900

XE SYSTEM: 130XE, 1050 Disk Drive with US Doubler, RTIME-8 clock

XE SE / recorder / Phone C / XL SYS / XC11 co / als. Lock / discs), Jo / 1-44, du / languag / Alan on / MIDI K / sional s / box and / files). C / o.n.o. K / 376091 / PRINTI / lent con / AtariWri / Djordjev

More Fleet Street graphics

results will be far from what you expected. Unless the laser is directly supported by software the results may be extremely disappointing. Believe it or not, graphics produced on a laser printer used in Epson emulation mode can be considerably inferior to an Epson 9 pin dot matrix printer!

NOW GO AND BUY

As stated at the beginning of this feature, it is impossible to give more than just a few guidelines about choosing a printer as the choice is so varied. A whole book could be written describing each of the available models. We have reached the end of the road as far as this feature goes having gone from the humble 1020 to the mighty laser. Before you turn the page, check out all the other parts of this feature about interfaces and compatibility and the like and then make up your own mind. If you don't have a lot of money for a printer, decide what you want the printer to do and buy accordingly. If you bear all the above information in mind you will not go far wrong,

Choosing a printer really is like trekking through the jungle but, hopefully, we have shed a little light to guide you on your way.

More Overleaf

THE RIGHT CONNECTION

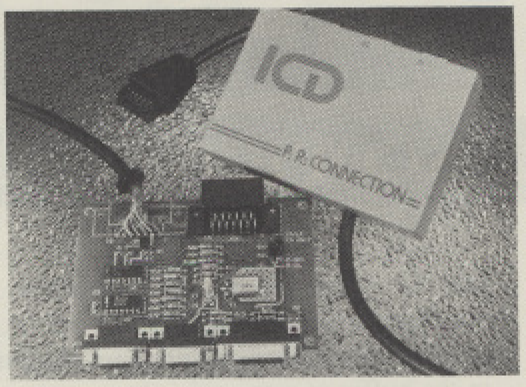
How to choose the bits in between

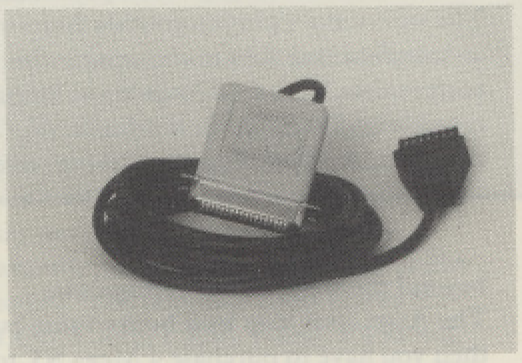
Many third party printers come without any sort of cable to connect up to your Atari so you will have to purchase a suitable cable and in the case of the XL/XE machines an interface as well. The people who sell you your printer should be able to supply you with the necessary cable but be careful, for you might get stung for up to £25 for a cable when you can get a similar cable elsewhere for around £8!

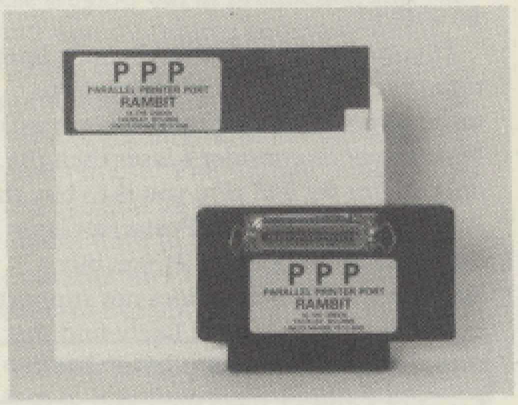
If you have an ST and a Centronics parallel printer then a cable will be readily available but these do range in quality from the fairly insubstantial to quite solid, hardly-bendable super cables. They also come in different lengths so bear this in mind. A 1 metre cable can be quite restricting, especially if you have other equipment hooked up. There are also flat ribbon cables available which in some cases can be more convenient as they can easily be tucked under such items as hard disk drives etc. It is difficult to recommend a particular cable as they all do the job and price varies considerably. Best place to check is the advertisements in PCW magazine where you will find quite a choice. Give the advertiser a ring first to find out just what type of cable he supplies.

XL/XE owners will, unfortunately, need more than just a cable to get a non-Atari printer working their systems. You will need an interface of which there is currently a fair choice ranging from around £30 up to about £90. The most obvious choice is the **ATARI 850 INTERFACE** which can connect up one parallel device (a printer) and up to four serial devices such as modems. This simply plugs into the I/O port of your computer and can be 'daisy chained' to other peripherals. You will still need a cable from the 850 to your printer and may have to have this made up as it it not the standard Centronics fitting at the interface end. The 850 is no longer available new and you will have to pay around £80 second hand. If you can get one cheaper it may be worthwhile but you might want to consider something else.

The **P:R: CONNECTION** is the other full interface connection allowing a parallel printer and two serial devices to be connected. The unit is well made and worthwhile, especially if you may want to explore telecommunications in the future. It was designed as a replacement







for the 850 interface and, as such it succeeds well. This is another unit that you just plug in and forget as far as your printer goes and it should cause no problems. A full review appeared in Issue 30. It will cost you £69.95 new and is readliy available from your local dealer or from the distributors Frontier Software.

The advantage of the above two units is that you do not need to start again if you want to add a modem to your system at a later date. If all you need, however, is a straight connection to your printer then there are other alternatives which are basically cables with an interface built in.

The most sophisticated of these is the **GRAPHIX AT** which retails at £59.95 but which can be obtained cheaper. It is a standard cable which plugs into the printer at one end and the Atari serial port at the other but has an interface box a few inches from the Atari end. This interface is unusual in that it can be configured in several ways by using 8 dip switches on the top of the unit. The intention of these is to make the interface flexible enough to handle any printer configuration but in practice this will only be found useful if your computer is used with more than one type of printer. The interface can be set so that control codes are ignored or printed, line feed can be off or on and the non-standard Atari Carriage Return is changed to ASCII or not. The remaining dip switches allow you to configure the interface to several types of printer. To be honest almost all of this can be obtained from dip switches built into the printer or by software control so what the advantages are I am not sure. Often, non-technically minded owners are confused when dip switches set on the interface clash with those set on the printer. If you like gadgets, the GRAPHIX AT will be worth playing with but there are much simpler interfaces around.

A much simpler alternative which does the job equally as well is the **MICRO PRINT INTERFACE** from Supra, also distributed here by Frontier Software. This comes as a 50" long cable which plugs into the serial port of your Atari with an interface at the other end that plugs into a Centronics standard printer. The interface box measures 3" by 3.5" by 1" so is fairly unobtrusive when plugged into the printer. This end, whilst having a standard Centronics plug, does not use the retaining clips found on all printers so that it does seem as if it may fall out at any time. The interface is quite heavy and on printers that do not have their connectors close to the bottom of the printer it tends to sag, leaving you with the feeling that an accidental jolt could snap the PCB. However, it works and is completely 'transparent', just plug it in and go. It will cost you around £29.95.

A much better interface cable **ICD PRINTER CONNECTION** which is similar to the Supra interface but is altogether a much more compact and well finished unit. This comes with an

incredible 10 feet of cable enabling you to site you printer almost anywhere. The interface end is a super, compact, light unit being no wider or deeper than the Centronics plug and just 2½" long. It has the facility to use the standard retaining clips and you will hardly notice that it is there. This is priced at $59.95 in the States and has not, in the past, been easily available over here but Frontier Software are now distributing this interface at just £29.95 which must make it the first choice for any 8-bit owner. Another one that you just plug in and forget. Highly recommended.

Finally there is the **P.P.P. Interface** from Rambit which, at £29.95, is intended to allow you to connect up your printer at a budget price. This comes as an interface box which connects to the Parallel Bus Interface of the XL or XE machines and then, via a standard Centronics cable which you must supply, to your printer. The interface is software driven either by disk or cassette but has the option of an EPROM driver which can be fitted to your computer thus avoiding the need to boot software each time. The disadvantage of software drivers is that they will not work with all word processors, for example it is difficult, or impossible, to load the printer driver and then a word processor that has to be booted by a power-on. The Eprom solves this problem but then puts the price up to £34.95 which is more than the Micro Print interface which you can just plug straight in. You may also need to buy a Centronics cable which will add at least £8 to the price. The P.P.P interface works but, sadly, does not compare favourably with the Micro Print interface. A great pity, as small companies such as Rambit deserve support in the Atari community for continuing to make products available when others don't. In the days of the 850 as the only choice, the P.P.P. would have been exellent value but now it has strong competition. If Rambit could afford to reduce the price they would find many more customers but, unless you can sell in great volume, obtaining the lowest price on components is not easy.

So there you have a choice of most of the currently available interfaces and cables. Don't forget about connecting up or you could find yourself as the proud owner of a brand new printer that won't talk to your Atari!

STARTRAK
Game Controller
from RHdesign
£18.85



Reviewed by John Davison jnr

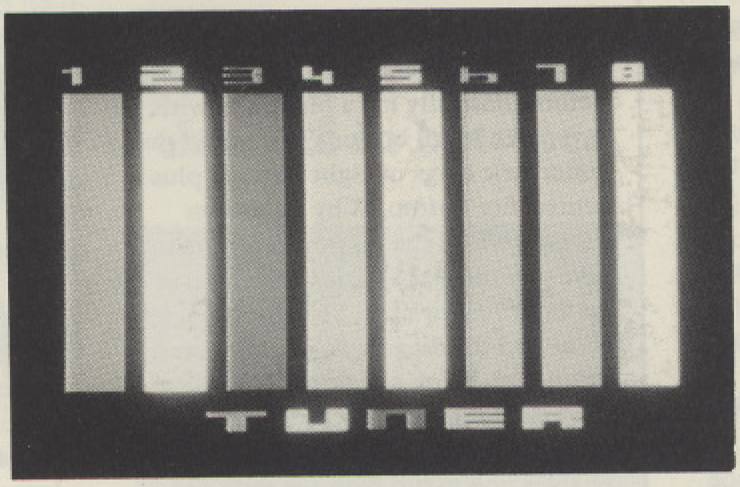
StarTrak is a form of game controller which I don't believe I've come across before. Basically it's a black box with seventeen small buttons laid out in two concentric rings of eight buttons plus a central fire button. Why seventeen buttons? Well the reason for this is to give you the eight basic directions, as on a normal joystick, i.e. up, down, left right and the diagonals, and the same again with firing activated. Below the buttons on the unit is the StarTrak logo sticker and a three way switch which enables you to flip between auto fire, 'burst' fire or normal firing. The unit supplied did not have a cable permanently attached. You must plug the supplied cable into a nine pin connector on the front edge of the unit but I understand that this may be redesigned so that the cable is permanently fixed. It really needs it as the cable tends to fall out in use. The cable supplied with my unit was around ten feet long, which is considerably longer than the average joystick cable – a good or a bad point depending on your point of view.

I tried StarTrak with many different games including Rampage, SuperSprint, Trauma, International Karate, Airball and FrostByte. I found I soon got used to using it with FrostByte and Airball, but on the other hand SuperSprint was near enough impossible to play (for me anyway!). In most cases I did not get on very well with it at all. One game which really did benefit was Airball, because using StarTrak made it easy to obtain accurate diagonal movement. I would have expected it to make Karate games easy to play but after a few rounds with International Karate, which with a normal stick I can usually keep going for a long time, I found the computer was consistently beating me! The controller is suitable for any game in which diagonals are needed a great deal of the time, but for most games like shoot 'em ups where fast reactions are needed I just couldn't get on with it.

The construction of the stick is not very good, being very light and not really very strong. Whilst testing the controller I found two things which annoyed me. The first was the cable slipping out from the socket mentioned above and the other was the fact that the fire button kept inexplicably locking even though the auto fire switch was not activated. I hope that these are just minor faults with my particular unit.

If you are not used to any one particular type of controller then you might be able to get used to StarTrak – but for me, I'm going to return to my simple Atari stick. Try before you buy, it is quite different from a normal joystick. You may take to it straight away, I couldn't! ●

COLOUR TUNER



Choosing the right colours made easy

by John Lawford

Last summer I got confused, not for the first time I might add. Perhaps confused is the wrong word, disheartened may be closer, fed up even and it wasn't just with the weather or the little lady demanding that, the moment the monsoon ended, something had to be done about the lawn. Sometimes those computer terms take a long time to grasp!

Even after reading up the SETCOLOR command for the umpteenth time I still had to write little notes to myself which I subsequently couldn't decipher so I decided it was less hassle to forget all about SETCOLOR and go back to POKEing the COLOR registers with the color value*16+luminance. Great. I knew that, according to the book, 40 would give me a lightish orange but how light? Even then I had to work out that 2*16+8 was 40. The color number was simple enough I could look that up but exactly which shade would a luminance of 8 give me. It was time to forget about the lawn, pray for more rain and get down to some programming – The result was COLOUR TUNER.

USING ALL THE COLOURS

I chose to use Graphics 10 one of ATARI's marvellous GTIA modes, because it would give me a chance to play around with all the color registers from 704 to 712. I needed a way to vary the luminance from the keyboard and to be able to see the effects immediately on the screen so I decided to use the console keys to achieve this. Pressing SELECT would increase the luminance in steps of two and OPTION would decrease the value by two steps. When the brightness value exceeded color+16 then the shade would move on to the next colour and so on. After a few minor hiccups I had a passable little program.

STICK IN A DLI!

What was needed now was an interesting introduction page in Graphics 0 but not in that boring old blue and white. I remembered reading somewhere that it was possible to set a DLI (Display List Interrupt) on any line – but how?

Out with the books again and another two hours of semi-confusion but eventually I stitched together the subroutine which starts at Line 20000. Basically it is a small machine code routine which sets and enables the interrupts. It reads the data starting at Line 20360 and loads location 710 with the background colour and location 709 with the luminance of the characters. As I wanted the background to be light pastel shades, the majority of the text had to be dark so the character luminances were set to 0.

I used COLOUR TUNER to experiment with the background colours and used the values obtained as the data for Lines 20360 – 20380. You can use this routine in your own programs to create Graphic 0 screens in glorious technicolor. Simply GOSUB 20000 and sit back in amazement at your own artistic talents. The screen will stay as you designed it until you press RESET or change the Graphics mode, when you will have to call the subroutine again to get it back.

USING COLOR TUNER

When you first run the program there will be a slight pause while the machine code is loaded and if you've made no typing mistakes you'll see the colourful introduction screen.

Pressing START will move you into the main program and you should see eight grey bars being drawn each with a figure above it, not exactly world shattering at this stage but type a number from 1 to 8 for the bar you wish to tune and press SELECT. If you keep your finger on the button the colours will cycle through the available shades. Use OPTION to step back and use the two buttons to arrive at just the colour you had in mind for each of the 8 bars. Press the 0 key to work on the background and when everything is to your liking, press Q to see the values you should POKE into the color registers to get your selected colour.

It's as simple as that. A neat way to get exactly the colours you want without guesswork. Trouble is, writing those programs takes less time now so I guess I'll have to go and mow that lawn after all!

```
QK 1 REM ******************************
WX 2 REM *        COLOUR TUNER        *
ZB 3 REM *             by             *
YA 4 REM *        John Lawford        *
DZ 5 REM *----------------------------*
HS 6 REM * PAGE 6 Magazine - ENGLAND *
QQ 7 REM ******************************
NN 8 REM
GI 10 GRAPHICS 0:QQ=PEEK(559):POKE 559,0:
   GOSUB 20000:POKE 559,QQ:DIM A$(1),R(9)
   :POKE 752,1
TN 20 ? "         ↓ GRAPHICS 10 FINE TUNER"
ZO 30 ? "↓↓USE KEY 1-8 TO SELECT ANY OF T
   HE"
UY 40 ? "GREY BLOCKS ON THE GRAPHICS 10 "
YQ 50 ? "SCREEN WHICH FOLLOWS"
OU 60 ? :? "EACH CAN BE FINE TUNED TO THE
    EXACT"
DU 70 ? "COLOUR OF YOUR CHOICE BY PRESSIN
   G"
KH 80 ? "SELECT TO INCREASE OPTION TO DEC
   REASE"
MO 90 ? "USE KEY 0 TO TUNE BACKGROUND"
SY 100 ? :? "        PRESS 'Q' FOR COLOR DA
   TA":FOR V=15 TO 0 STEP -0.05:SOUND 0,5
   0,12,V:NEXT V
KV 110 POSITION 10,18:? "PRESS START TO B
   EGIN":F=1
XL 120 Q=PEEK(53279):IF Q=6 THEN 140
LP 130 FOR W=1 TO 150:NEXT W:POSITION 16,
   18:? "     ":FOR W=1 TO 150:NEXT W:POS
   ITION 16,18:? "START":GOTO 120
FW 140 REM SET UP COLOUR REGISTER VALUES
ID 150 GRAPHICS 10:OPEN #1,4,0,"K:"
QH 155 IF T=0 THEN FOR I=705 TO 712:POKE
   I,4:NEXT I:POKE 704,R(0):GOTO 170
EV 158 IF T=1 THEN FOR I=0 TO 8:POKE 704+
   I,R(I):NEXT I:GOTO 170
CN 160 REM IF T=1 THEN T=0:FOR I=0 TO 8:P
   OKE 704+I,R(I):POKE 704,R(0)
XX 170 COLOR 1
JW 180 FOR I=8 TO 13:PLOT I,30:DRAWTO I,1
   50:NEXT I:GOSUB 600
WQ 190 COLOR 2:FOR I=16 TO 21:PLOT I,30:D
   RAWTO I,150:NEXT I:GOSUB 610
GC 200 COLOR 3:FOR I=24 TO 29:PLOT I,30:D
   RAWTO I,150:NEXT I:GOSUB 620
HG 210 COLOR 4:FOR I=32 TO 37:PLOT I,30:D
   RAWTO I,150:NEXT I:GOSUB 630
IK 220 COLOR 5:FOR I=40 TO 45:PLOT I,30:D
   RAWTO I,150:NEXT I:GOSUB 640
QN 230 COLOR 6:FOR I=48 TO 53:PLOT I,30:D
   RAWTO I,150:NEXT I:GOSUB 650
RR 240 COLOR 7:FOR I=56 TO 61:PLOT I,30:D
   RAWTO I,150:NEXT I:GOSUB 660
BW 250 COLOR 8:FOR I=64 TO 69:PLOT I,30:D
   RAWTO I,150:NEXT I:GOSUB 670
UA 255 GOSUB 700
FI 260 IF PEEK(764)=255 THEN 260
RX 270 GOSUB 300
RD 280 REM
OX 290 GOTO 260
XM 300 GET #1,A:POKE 764,255:B=A-48
CF 310 IF A=0 THEN POP
ZB 320 IF A=ASC("Q") THEN 420
UL 330 REG=704+B:COL=PEEK(REG)
TZ 340 CON=PEEK(53279):IF CON=5 THEN COL=
   COL+2
PY 350 IF CON=3 THEN COL=COL-2
QQ 355 IF COL<0 OR COL>254 THEN COL=2
HR 360 POKE REG,COL:FOR W=1 TO 25:NEXT W
KI 370 FOR I=0 TO 8:R(I)=PEEK(704+I):NEXT
    I
WI 390 IF PEEK(764)<255 THEN RETURN
NV 400 GOTO 340
NV 410 END
XQ 420 ? #6;CHR$(125):GRAPHICS 0:POKE 710
   ,90:POKE 709,0
QS 430 POKE 752,1:? ,"↓↓REGISTER VALUES"
SD 440 ? :? ,"COLOR 0 : POKE 704,";R(0):?
    ,"COLOR 1 : POKE 705,";R(1):?
BY 450 ? ,"COLOR 2 : POKE 706,";R(2):? ,"
   COLOR 3 : POKE 707,";R(3):?
UE 460 ? ,"COLOR 4 : POKE 708,";R(4):? ,"
   COLOR 5 : POKE 709,";R(5):?
JY 470 ? ,"COLOR 6 : POKE 710,";R(6):? ,"
   COLOR 7 : POKE 711,";R(7):?
GW 480 ? ,"COLOR 8 : POKE 712,";R(8)
QM 490 ? "↓↓":? ,"FURTHER TUNING TYPE Y":
   ? ,"OR N TO QUIT"
XU 495 GET #1,CHAR:A$=CHR$(CHAR)
UE 500 IF A$="Y" THEN CLOSE #1:T=1:GOTO 1
   50
MR 510 IF A$="N" THEN 520
EZ 515 POKE 764,255:GOTO 495
KO 520 GRAPHICS 0:END
PN 599 END
EP 600 COLOR 1:PLOT 8,20:PLOT 9,19:DRAWTO
    9,25:RETURN
ID 610 COLOR 2:PLOT 16,19:DRAWTO 19,19:DR
   AWTO 19,22:DRAWTO 16,22:DRAWTO 16,25:D
   RAWTO 19,25:RETURN
EN 620 COLOR 3:PLOT 24,19:DRAWTO 27,19:DR
   AWTO 27,25:DRAWTO 24,25:PLOT 24,22:DRA
   WTO 27,22:RETURN
JR 630 COLOR 4:PLOT 32,19:DRAWTO 32,23:DR
   AWTO 34,23:PLOT 34,21:DRAWTO 34,25:RET
   URN
XU 640 COLOR 5:PLOT 43,19:DRAWTO 40,19:DR
   AWTO 40,22:DRAWTO 43,22:DRAWTO 43,25:D
   RAWTO 40,25:RETURN
ZC 650 COLOR 6:PLOT 48,19:DRAWTO 48,25:DR
   AWTO 51,25:DRAWTO 51,22:DRAWTO 48,22:R
   ETURN
XR 660 COLOR 7:PLOT 56,19:DRAWTO 58,19:DR
   AWTO 58,25:RETURN
DT 670 COLOR 8:PLOT 64,19:DRAWTO 64,25:DR
   AWTO 66,25:DRAWTO 66,19:PLOT 65,19:PLO
   T 65,22:RETURN
FN 700 COLOR 1:FOR X=22 TO 27:PLOT X,160:
   DRAWTO X,161:NEXT X:FOR X=24 TO 25:PLO
   T X,162:DRAWTO X,167:NEXT X
JI 710 COLOR 2:FOR X=30 TO 31:PLOT X,160:
   DRAWTO X,167:NEXT X:PLOT 32,166:PLOT 3
   2,167:PLOT 33,166:PLOT 33,167
YI 711 FOR X=34 TO 35:PLOT X,160:DRAWTO X
   ,167:NEXT X
TV 720 COLOR 3:FOR X=38 TO 39:PLOT X,160:
   DRAWTO X,167:NEXT X:FOR X=42 TO 43:PLO
   T X,160:DRAWTO X,167:NEXT X
TA 721 PLOT 40,160:PLOT 40,161:PLOT 41,16
   0:PLOT 41,161
YC 730 COLOR 4:FOR X=46 TO 47:PLOT X,160:
   DRAWTO X,167:NEXT X:PLOT 48,160:DRAWTO
    51,160:PLOT 48,161:DRAWTO 51,161
KQ 731 PLOT 48,163:DRAWTO 51,163:PLOT 48,
   164:DRAWTO 51,164:PLOT 48,166:DRAWTO 5
   1,166:PLOT 48,167:DRAWTO 51,167
EZ 740 COLOR 5:PLOT 54,160:DRAWTO 54,167:
   PLOT 55,160:DRAWTO 55,167:PLOT 56,160:
   PLOT 57,160:PLOT 56,161
UE 741 PLOT 57,161:PLOT 56,163:PLOT 57,16
   3:PLOT 56,164:PLOT 57,164:PLOT 58,160:
   DRAWTO 58,167:PLOT 59,160
PB 742 DRAWTO 59,163:PLOT 59,165:DRAWTO 5
   9,167
ZN 750 RETURN
CC 19999 END
NY 20000 REM LOAD SUBROUTINE FOR M/CODE,S
   ET AND ENABLE DLI'S
QF 20010 ? CHR$(125):ST=1664:RESTORE 2031
   0
PF 20020 FOR I=0 TO 99:READ D:POKE ST+I,D
   :NEXT I
IA 20030 COL=1712:LUM=1736
TF 20040 A=USR(1693)
XA 20050 POKE 512,128:POKE 513,6
YJ 20060 DLS=PEEK(560)+256*PEEK(561):FOR
   I=DLS+6 TO DLS+28:POKE I,130:NEXT I:PO
   KE DLS+3,194:POKE 54286,192
WE 20070 POKE 710,PEEK(COL):POKE 709,PEEK
   (LUM)
EE 20080 RETURN
DE 20090 REM MACHINE CODE DATA
VU 20310 DATA 72,138,72,174,156,6,189,176
   ,6,141
QC 20320 DATA 10,212,141,24,208,189,200,6
   ,141,23
QI 20330 DATA 208,238,156,6,104,170,104,6
   4,1,104
TO 20340 DATA 169,7,160,168,162,6,32,92,2
   28,96
FJ 20350 DATA 169,1,141,156,6,76,98,228
XY 20355 REM 24 LINES OF GR.0 BACKGROUND
   COLOR DATA. COLOR*16+BRIGHTNESS.
FY 20360 DATA 114,0,0,0,122,122,122,124
UK 20370 DATA 124,124,126,126,126,78,78,7
   8
ID 20380 DATA 60,60,60,62,62,62,28,28
QL 20385 REM BRIGHTNESS FOR CHARACTERS
UL 20390 DATA 14,14,14,14,14,0,0,0
XG 20400 DATA 0,0,0,0,0,0,0,0
NK 20410 DATA 0,0,0,0,0,0,0,0,0,0,0,0
```

22. STRANDED and Lapis Philosophorum

Garry Francis casts his eye over two very different adventures and gives the usual hints and tips

STRANDED

There was a time when English Software was the most prominent producer of Atari software in the U.K. The bulk of their product line consisted of simple arcade games, but during their reign, they also produced one (and only one) Adventure.

That was way back in 1984, so most Atari old-timers would probably have forgotten the game by now. New users have probably never even heard of it, yet it is still readily available. The game in question is Stranded.

Stranded is an illustrated Adventure written by D. Woodhouse and C. Hughes. Versions were released for both the Atari and the Coleslaw 64, the Atari version being available on disk or cassette for £9.95. The game copped a real bagging in magazine reviews and seemed to fade from existence after a very short life span. It was later re-released as part of a compilation disk called Atari Smash Hits Volume 2. This was much better value for money. For an extra £4.00 (or thereabouts), you not only got Stranded, but four arcade games as well – Jetboot Jack, Diamonds, Robin Hood and Citadel Warrior. This disk is still readily available, usually at a discounted price. I paid £10.95 from Sunaro Software.

Stranded may not be a real memorable game, but it does have its place in Atari history, for it was the first commercially released Atari Adventure on cassette which had graphics. Needless to say, the graphics commands for all locations had to reside in memory at the same time (because of the limitations of cassette) and therefore, the graphics had to be very simple. However, they are drawn reasonably fast and if you've seen Level 9's early graphics, then you'll know the sort of thing to expect.

The game itself has a rather corny storyline. You play the part of Special Agent Sid of the S.A.S. (Nearly every review of Stranded laughs at this name. Don't ask me why. It must be a private joke. Or maybe it's a reference to the sound chip in the Coleslaw 64! Now that WOULD be funny.) The year is 2510 A.D. You were returning home to earth aboard your spaceship when you were shot by a tranquiliser dart and left stranded on a strange planet. Your mission is to find your way home.

Once the game gets under way, the first thing you'll notice is the primitive, two-word parser and the lousy vocabulary. When entering a verb, only the first four letters are significant. Beware of verbs longer than four letters. Some can be spelt out in full and some must be truncated. For example, CLIMB is okay, but EXAMINE must be spelt EXAM.

The second thing you'll notice is the terrible map. It's one of those games where all the exits are screwed up for no apparent reason. For example, going north doesn't necessarily mean you can return by going south. You may have to go east or west or up or down or goodness knows where! There's also quite a few mini mazes to put your mapping skills to the test.

The third thing you'll notice is the logical inconsistencies in the game. For example, there's a robot which explodes, yet remains intact; trees which are climbable in one forest, but not in another; a door which mysteriously locks itself no matter how many times you pick the lock and a spaceship with one room while on the ground and sixteen while in flight. This is just a sample. There are many more.

The early puzzles are difficult – not because they were designed that way, but because of the lousy programming. However, they ARE solvable. I finished the whole game in a couple of hours. If you're a beginner, it may take considerably longer, but you can rest assured that persistence will pay dividends in the long run. If you are having trouble, make sure you type HELP in every room. This often gives a useful hint. If this doesn't help, then try the coded hints accompanying this article.

For me, the high point in the game was when I came quite unexpectedly upon Doctor Who's time machine, the Tardis. (Spell it backwards. There's Sid again! Is Rat his surname?) The picture showed the familiar blue Police Public Call Box seen so often in the TV series. I was wrapped, as I have only recently 'discovered' Doctor Who. Unfortunately, there were few, if any, other highlights.

Overall, Stranded is a disappointing game. As its difficulty is brought about by bad programming rather than hard puzzles, the accompanying hints should be quite valuable to anyone who's been stuck in the game for the past few years.

And to any other Coleslaw 64 programmers who are thinking of converting an Adventure to the Atari to make an extra few bucks ... don't bother!

LAPIS PHILOSOPHORUM

Wise King Gieselher of Alkanien has been poisoned by his stepson. Messengers have been sent throughout the land to find a cure for the poison, but so far, they have been unsuccessful. When a messenger visits you with news of the King's plight, you decide to come out of retirement and return to alchemy in order to concoct a potion to bring the King back to good health. Thus the scene is set for Lapis Philosophorum – The Philosopher's Stone.

Lapis Philosophorum was written in Germany by H. J. Richstein and A. Veldkamp. Fortunately for us, it has been translated to English and was distributed in the U.K. by Ariolasoft. *(Ariolasoft no longer have U.K. offices so current availability is uncertain. Ed.)* It has been available since late 1986, but strangely enough, it is rarely ever mentioned in advertisements or magazine articles. This is a pity, as it's really quite a good game.

I won't review Lapis Philosophorum here because I want to concentrate on game playing strategy. Apart from which, Jim Short has already reviewed it in issue 26 March/April 1987. The only comment I'll make is that the overall look and feel reminded me a lot of The Blade of Blackpoole which I covered way back in issue 12.

The game starts in the living room of your house. You are empty handed and have no idea how to begin mixing your potion. Asking for HELP often gives a useful hint or tid-bit of information, so get into the habit of using it every time you discover a new room. If you explore the house thoroughly using LOOK, EXAMINE and READ (they all give different responses) you should find an old book which tells you about a mysterious stone called the Lapis Philosophorum. This is said to be capable of creating a universal healing potion, but only the monks of the Moor Monastery know how the potion is produced. At least your objective is now clearer – find the monks and/or the Lapis Philosophorum.

(Lapis is Latin for stone. Philosophorum is no doubt a corruption of the Greek philosophos, meaning philosopher or lover of wisdom. Hence the subtitle, The Philosopher's Stone. Interestingly, the philosopher's stone was once believed to be real. The Concise Oxford Dictionary defines it as a 'supreme object of alchemy' or a 'substance supposed to change other metals into gold or silver'. Both uses are mentioned within the game.)

If you have trouble leaving the house, it's probably because you haven't tried all the directions. Each room has eight possible exits – N, S, E, W, U, D, IN and OUT. The latter two aren't mentioned in the instructions.

Once you've left the house, you'll find yourself in the middle of the city. You can't leave the city just yet because of the guards on the gate, but there is plenty to explore and do in the meantime. You could try finding another way out, but I won't guarantee there is one. The city's many tradesmen could prove helpful here, but if you borrow anything from them, make sure you return it on time (within 50 moves)! You could also try overcoming your fear of rodents and your dislike of felines or doing a good turn for a little old lady. Her gratitude could provide the key you need to leave the city. (You are getting sleepy ... sleepy ... You are falling asleep ...)

If you leave the city at this point, you might be leaving a lot behind. Oh, if only you had some money! Ever tried busking? Some find it quite profitable.

Once you've got some money, it's off to the market place for a buying spree. What's this? Only a pig for sale? Sheesh. What a lousy market place! You will later find that the market place actually sells lots of neat things of interest to a retired alchemist-cum-adventurer, but the vendors keep things out of sight for fear of thieves. As the Adventure continues and you think of something that may be useful, come back to the market place and try to buy it. It will usually be available. You have enough money to buy a set number of things. All but one come from the market place. When the money runs out, you'll know that the market place's usefulness has also run out.

By now, you should be ready to venture beyond the city gates. The countryside of Alkanien consists of scattered plains and forests broken up by a wildly meandering river. The river creates a barrier which must be crossed several times during the game. You'll first encounter it just north of the city where the path branches and crosses two bridges. One leads to the King's castle, but the guards won't let you in without a cure for the King. The other leads to a horde of drunken knights. How can you get past the knights without getting mugged? Violence isn't the answer. Hmm, all this talk of knights reminds me of nights and curling up in bed with a good book to reed. Also, remember the market place.

Once past the knights the game really opens up and the puzzles get harder. First of all, you will probably find a thin crack in the nearby rocks which allows you to see into a cave. You CANNOT fit through the crack or get the object you see in the cave, but you CAN get into the cave another way. Make sure you draw a neat map, because geographically, this game is very well laid out.

A little further north, you'll find a seemingly useless wood, but a bit of thought and a trip to the market place should pay dividends here. If you sleep all night and work all day, wear suspenders and a bra, you'll have no trouble with this one!

Just west of the wood, you'll encounter the river again. You can cross the river at three different points using three different methods in order to access three different areas. I'll refer to these as the north, south and west areas. You'll probably visit the south area first because you only have to cross a bridge. Explore it thoroughly and collect all the useful items.

Accessing the north area isn't quite so easy. Make sure you type HELP for a valuable hint and before long you'll be paddling down the river – but don't paddle TOO far!

When you're on land again, you'll find a cave which you probably can't enter yet, but a trip to the market place will solve that problem.

Once inside, your progress is blocked by a sly and crafty troll. He will only let you past if you succeed in a life or death game of hangman. This turns out to be quite a fun game within the game, which can be played over and over again if you've saved the game beforehand.

The program has a list of 50 words. Each word is ten characters long. The first time you play the game, a word is picked at random. From then on, the program cycles through the words in the same order.

The normal strategy in playing hangman is to try all the vowels first, then fill in the gaps by picking the most promising looking consonants. This strategy works here too, except that you cannot always afford to try all the vowels. You can only miss four characters before you get hung! Start with 'E', then get a little more selective. For those having trouble, a full list of the words accompanies this article. But no cheating! Give it a go yourself and only use the list as a last resort!

Note that there is a bug in the program which causes rubbish in one word. On one occasion, I went through another

25 words of rubbish before realising something was drastically wrong. The symptoms included no vowels and spaces imbedded within the words. If this happens to you, reboot and try again.

Once past the troll, the cave can be freely explored ... well, almost. Beware of the partially collapsed tunnel!

The troll will block your way again when you decide to leave. This is a ticklish problem. Just remember that trolls are greedy!

Accessing the west area requires you to somehow attract the attention of the ferryman on the other bank of the river. If you manage that, you'll soon find yourself at the abandoned Moor Monastery, but without a way to get in! Remember the damp depression? Remember the market place? Remember the blacksmith? If you dig around I'm sure you'll find the key to this puzzle and if you get some help, you'll be able to turn a negative situation into something positive.

Once inside the monastery, you'll need some brute force to open the warped door in the courtyard. Aha! A jewel case! Pity the combination for the lock doesn't work any more. Everything here is in a bit of a mess. Maybe it's time to do some cleaning up. Mirror, mirror safe and sound, where's the combination found?

Once you've managed to open the jewel case, your course of action will become clear. Just collect the four ingredients (most of which – if not all – you will have found by now) and mix them together at the appropriate place. The last thing left to do is to take the life giving potion to the King, but be prepared for a surprising (and humorous) ending!

NEXT ISSUE

Les tells me that next issue is an Adventure Special Issue. I'm looking forward to that one! I'll have a bumper crop of Adventure hints from over thirty different Adventures and maybe one or two other surprises. See you then.

As always, feel free to write if you have suggestions for the column or if you'd just like an Adventure hint, but include two International Reply Coupons if you'd like a reply.

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HANGMAN WORDS FOR LAPIS PHILOSOPHORUM

EXHIBITION	CHALLENGER	HITCHHIKER
EXPERIENCE	AGGRESSION	LITERATURE
EXPERIMENT	SUGGESTION	MASQUERADE
LITHOGRAPH	PARLIAMENT	LIEUTENANT
MOUNTEBANK	EXPEDITION	MASTERSHIP
NAVIGATION	DEPARTMENT	INTERLOPER
PHOTOGRAPH	SATELLITES	MELANCHOLY
OPPOSITION	STATEMENTS	INVOCATION
PERFECTION	GASTRONOMY	HIEROGLYPH
REPERTOIRE	HELICOPTER	HYPOTHESIS
SEPARATION	CONCLUSION	INITIATIVE
GOVERNMENT	SAUERKRAUT	HYPOTENUSE
SKYSCRAPER	LABORATORY	PENICILLIN
PERCUSSION	INSTRUMENT	SUBMISSION
STRAWBERRY	WILDEBEEST	TURPENTINE
VOCABULARY	RHINOCEROS	AGAINST S
ADVENTURER	INTERMEZZO	

Garry Francis' ADVENTURE HINTS

STRANDED

1. Can't find your way in the forest?
41 27 24 47 31 3 36 6 13 29 42
2. Can't find your way in the desert?
41 27 10 47 31 3 36 6 13 29 42
3. Can't get past the robot?
39 35
4. Missing a robot deactivator?
41 28 19
5. Still can't get past the robot?
39 46
6. Missing a laser rifle?
39 1
7. Can't find the small ledge?
39 5
8. Missing a parachute?
39 12 18
9. Can't climb the tree?
39 43 19
10. Can't enter the spaceship?
8
11. Can't open the inner door of the airlock?
39 20
12. Spaceship refuses to blast off?
7 23
13. Can't survive the radiation?
27 32 14 30 23
14. Missing a space suit?
17 33 4 16 19
15. Can't find your way through the maze of machinery?
41 27 24 47 31 3 36 6 13 29 42
16. Can't survive in space?
27 32 25 23
17. Can't enter the Tardis?
40 37 22 31
18. Can't operate the Tardis?
44 26 2 23
19. Missing a time crystal?
39 21 45
20. Can't find Doctor Who?
9 38 43 15
21. Can't find your way in the labyrinth of twisty tunnels?
41 27 24 47 31 3 36 6 13 29 42
22. Can't find your way in the grassy hills?
41 27 10 47 31 3 36 6 13 29 42
23. Can't open the door to your house?
39 11
24. Missing a key?
39 34

LAPIS PHILOSOPHORUM

1. Can't climb the city wall?
15 50
2. Can't get the cat?
48 11 27
3. Can't get the mice?
17 58
4. Can't get the necklace?
37 14 29
5. Haven't got the money to buy anything?
16 63 44 43
6. Can't get past the guards at the city gate?
26 51
7. Can't get past the guards in front of the King's castle?
47 5 19
8. Can't get past the drunken knights?
49 44 31
9. Can't get the reeds?
18 51
10. Missing a knife?
7 13
11. Can't get the imprint without crushing it?
32
12. Missing a shovel?
7 13
13. Can't get the ferryman's attention?
7 45 36
14. Can't find any matches?
47 64 5 51
15. Can't enter the monastery?
52 53 14 46
16. Can't open the warped door?
61 23 10
17. Can't open the jewel case?
7 12
18. Can't read the inscription on the boulder at the edge of the swamp?
2 40
19. Can't find the Edelweiss?
4 57 56 41 42 47 22 24
20. Can't get to the ledge?
6 28 12 14 34 62 4 23
21. Can't get down the river?
65 55
22. Can't find any boat-building materials?
9 59 62 18 56
23. Missing an axe?
7 13
24. Can't move your boat?
7 21
25. Can't enter the cave?
7 13
26. Troll won't let you into the cave?
37 14 3 62 30 20 60
27. Can't survive the landslide in the tunnel?
65 54
28. Troll won't let you out of the cave?
25 35 39
29. Can't make the elixir?
1 8
30. Still can't make the elixir?
38 23 44 33

STRANDED

1 LEDGE	25 SURPRISED
2 EMPTY	26 SLOT
3 DROP	27 ARE
4 MIGHT	28 ISN'T
5 PARACHUTE	29 THEM
6 TO	30 DRESSED
7 FUEL	31 ...
8 JUMP	32 YOU
9 HE'S	33 WHO
10 THREE	34 CAVES
11 KEY	35 DEACTIVATOR
12 TARZAN	36 SOMETHING
13 MAKE	37 WORKED
14 ADEQUATELY	38 IN
15 DIMENSION	39 TRY
16 HAVE	40 IT
17 DOCTOR	41 THERE
18 TERRITORY	42 UNIQUE
19 ONE	43 ANOTHER
20 DESERT	44 IS
21 MAIN	45 REACTOR
22 BEFORE	46 LASER
23 ?	47 ROOMS
24 TWO	

LAPIS PHILOSOPHORUM

1 FOLLOW	34 HERE
2 CLEAN	35 IS
3 HIM	36 SIGNALS
4 CLIMB	37 TALK
5 NEED	38 MAKE
6 PUSH	39 TICKLISH
7 TRY	40 COPPER
8 RECIPE	41 WHAT
9 BUY	42 DO
10 DOWN	43 PUB
11 DICKORY	44 IN
12 BOULDER	45 SMOKE
13 MARKETPLACE	46 BLACKSMITH
14 TO	47 YOU
15 BORROW	48 HICKORY
16 PLAY	49 HIDE
17 CATCH	50 LADDER
18 CUT	51 THEM
19 ELIXIR	52 SHOW
20 HIS	53 IMPRESSION
21 STICK	54 BRACE
22 SEE	55 RAFT
23 IT	56 TREE
24 ?	57 STUNTED
25 DRAGON	58 ONE
26 HYPNOTISE	59 ROPE
27 DOCK	60 CHALLENGE
28 ROUND	61 BREAK
29 LADY	62 AND
30 ACCEPT	63 LUTE
31 RIVER	64 DON'T
32 DIG	65 BUILD
33 LABORATORY	

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HEAV
MET

Thirty five screens, evil ball bearings, slime and much more in this machine code extravanganza from Paul Lay

HEAVY METAL is a 3D arcade adventure for any ATARI 400/800/XL/XE with at least 48K RAM and a joystick.

Your mission is to recover the seven lost jewels which have been scattered throughout the deadly mazeworld of rooms that you inhabit. You control a spinning ball-bearing with a joystick in port 1. Move the joystick in the appropriate direction you wish to move. You may climb walls that are low enough and you may also fall off walls, although you'll die if you fall too far! Hold the trigger to put the brakes on and stop your ball-bearing from moving.

In each room there may be a number of teleports which will transport you to another location. These are marked by a diamond floor pattern. Simply stop on the transporter then press and release the trigger to energize! In your quest you will encounter a stomping boot, an evil black ball-bearing and a nasty piece of slime. Contact with any of these is fatal. To collect a jewel simply move over it. You have a certain amount of time and your game is over when you run out of time. Getting killed simply costs you time and you'll start that room again.

Use START to begin a game at the first location. Use OPTION to begin a game from the last location visited, however you lose any jewels previously collected and so you'll have to go back for them. Use SPACE to pause, then any key to resume. Use ESC to abort a game in case you get stuck somewhere!

Paul Lay

Paul Lay is well known to PAGE 6 readers through his previously published articles and programs and as he has stated that Heavy Metal might be his last 8-bit program we thought it an opportune moment to bring you a short biography.

Paul Lay B.Sc.(Eng) A.C.G.I. is a 22 year old Software Engineer from Billericay, Essex. He graduated two years ago from Imperial College, London with an honours degree in Computing Science. Paul's first exposure to Atari was with the good old VCS but his first experience in computing for real came at school when he opted to take an 'O' Level Computer Studies course. Shortly after, he received a Sinclair ZX81 as a 16th birthday present and immediately started cramming all sorts of things into a whole 1k RAM! A couple of years later, after learning to program on his Uncle's Atari, Paul became the proud owner of a 48k Atari 800 which is still going strong today.

With his own machine, Paul started writing some short machine code utility programs and submitted them to Personal Computer World magazine with a fair degree of success. His first submission won the Program of the Month award and later appeared in the PCW 'Best of' book. A little later he was introduced to Page 6 magazine in which he has now had quite a few programs published. Freeway Ace! was the first back in issue 16 and Heavy Metal is the latest but, hopefully, not the last.

With a few magazine listings under his belt, Paul decided to have a go at writing a commercial game. The result was Sprong which was initially released by Bignose Software and then later re-released by Red Rat Software. It features some excellent graphics reminiscent of the best American games of the time.

At university Paul had studied Pascal, Modula 2, C, Micro Prolog, Hope and Simula together with PDP-11 Assembler. In fact his third year project was a PDP-11 Assembler and Emulator written in C. With this background Paul just had to get an ST and found his university work a good grounding for learning 68000 assembler. Shortly after Paul acquired the ST, Analog magazine announced a $5000 programming competition so he set to work on a conversion of an 8-bit game that he had already had published in Analog called Floyd The Droid Goes Blastin. The result was a game called Floyd The Droid On The Run, which won the first prize! Unfortunately Analog went bust before parting with the prize money so he had the fame but not the fortune!

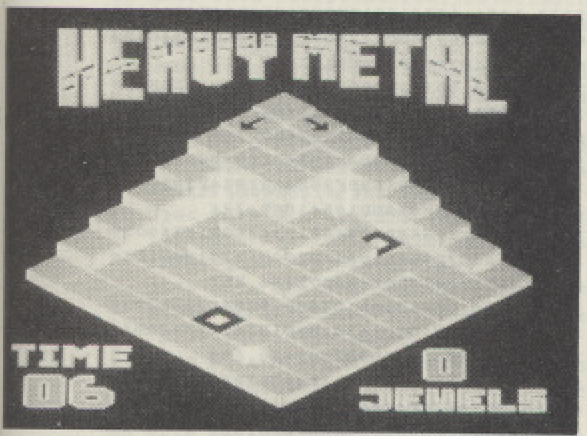
One consolation was that Argus Press Software spotted the program and arranged with Analog to market it outside the U.S. The result was an improved version entitled Missing: One Droid which appeared on the Bug Byte label as a budget title on both 8-bit and ST formats.

VY

TAL

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Currently Paul has written a new game for the ST entitled Crossland, which is being released by Microdeal. Paul says it is easily the best arcade game he has written to date and it should be available by the time you read this. The graphics for the program were done by Harvey A. Kong Tin from New Zealand who has also been a contributor to Page 6. They got together as the result of Harvey writing to Paul about one of the programs he had had published in PAGE 6 and the result was a collaboration between two people on the opposite sides of the world!

Making a living writing the odd program is not easy so, after graduating, Paul took a job with ITT where he worked on test software for digital telephone exchanges. He is currently employed by Syco Systems as a Software Engineer working on software for the music industry where he comes into contact with some of today's top stars. When you consideer one of the programs he has had published in PAGE 6 that is quite appropriate!

```
IX 0 REM ******************************
NJ 1 REM *        Heavy Metal         *
SS 2 REM *            By              *
IO 3 REM *         Paul Lay           *
UT 4 REM * -------------------------- *
UI 5 REM * PAGE 6 Magazine England *
JD 6 REM ******************************
EV 7 REM * Object code loader is    *
KT 8 REM * based on ANALOG version *
JG 9 REM ******************************
FT 10 GRAPHICS 0:DIM CODE$(93),HEX(22):DA
   TA 0,1,2,3,4,5,6,7,8,9,0,0,0,0,0,0,0,1
   0,11,12,13,14,15
SR 20 FOR I=0 TO 22:READ J:HEX(I)=J:NEXT
   I:? :? "HEAVY METAL":OUTPUT=0:? :? "**
   * CHECKING DATA"
XH 30 TRAP 100:RESTORE 1000:FOR LINE=1000
    TO 3820 STEP 10:? "LINE ";LINE;:TOTAL
   =0
WG 40 READ CODE$:IF LINE<>PEEK(183)+256*P
   EEK(184) THEN ? " MISSING!":END
VG 50 IF LEN(CODE$)<>92 THEN 100
BG 60 FOR I=1 TO 46:BYTE=16*HEX(ASC(CODE$
   (2*I-1))-48)+HEX(ASC(CODE$(2*I))-48)
OS 70 IF OUTPUT THEN PUT #1,BYTE:NEXT I:R
   EAD CHKSUM:? :NEXT LINE:CLOSE #1:? :?
   "***FILE CREATED":END
SH 80 TOTAL=TOTAL+BYTE:NEXT I:IF TOTAL>10
   00 THEN TOTAL=TOTAL-1000*(INT(TOTAL/10
   00))
ZL 90 READ CHKSUM:IF TOTAL=CHKSUM THEN ?
   :NEXT LINE:GOTO 110
LD 100 ? " BAD DATA":END
BF 110 ? :? "***CREATE FILE":? "C..CASSET
   TE (BOOT)":? "D..DISK (BINARY LOAD)"
RA 120 K=PEEK(764):IF K<>18 AND K<>58 THE
   N 120
JC 130 POKE 764,255:IF K=58 THEN 160
PY 140 ? "READY CASSETTE AND PRESS RETURN
   ";:OPEN #1,8,128,"C:":? :RESTORE 190:F
   OR I=1 TO 14:READ J:PUT #1,J:NEXT I
JN 150 ? :? "***WRITING FILE":OUTPUT=1:GO
   TO 30
WA 160 ? "INSERT DISK WITH DOS, PRESS RET
   URN";
HV 170 IF PEEK(764)<>12 THEN 170
WU 180 POKE 764,255:OPEN #1,8,0,"D:AUTORU
   N.SYS":? :RESTORE 200:FOR I=1 TO 6:REA
   D J:PUT #1,J:NEXT I:GOTO 150
PG 190 DATA 0,102,242,31,0,0,169,60,141,2
   ,211,76,33,40
ZR 200 DATA 255,255,0,32,211,02
TY 1000 DATA 000000000000000000000000000000
   00000000000000000000000000000000000000
   007070704EF0010E0E0E0E0E,867
JA 1010 DATA 0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E0E0E0E0E0E0E0E0E,644
NE 1020 DATA 0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E4E00900E0E0E0E0E,824
JG 1030 DATA 0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E0E0E0E0E0E0E0E0E,644
JJ 1040 DATA 0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E0E
   0E0E0E0E0E0E0E0E0E0E0E0E,644
XO 1050 DATA 0E0E0E41222070707070420C21F0
   080808080808080870080808080808080070027052
   E82141EC2000000000000000,102
UF 1060 DATA 306167650016002D6167617A696E
   6500307265736E747300000000000000000050
   14AAA81550A02850145014A000,70
TF 1070 DATA 5014A02850145014A00005014A028
   50145554AAA05554A02815545014A00005014A0
   2800145014A00050142AA00014,195
AY 1080 DATA 5014AAA850140A800550A0285554
   AAA81550A000A8A85000020050140A000AAA850
   0002005014A000A22855500200,456
EU 1090 DATA 5554A000A028500002005014A000
   A0285000020050140A000A02855540200501 4AA
   A8000000000000000000000000,222
QL 1100 DATA 00002279003061756C002C617900
   00000000000000000000000000000000000000
   000000000000000000000000,787
GC 1110 DATA 000000000000000000000000000000
   00000000000000000000000000000000000000
   0000396F7572002D697373696F,995
WD 1120 DATA 6E1A00000000000000000000000000
   00000000000000003265636F7665720034686500
   336576656E002C6F7374002A65,97
OG 1130 DATA 77656C730000000000000000000000
   0000000000000000000000236F6E74726F6C73
   1A0000000000000000000000,289
EF 1140 DATA 000000000000000000000000000000
   003B33342132343D00346F00226567696E0000
   000000000000000000000000,974
MT 1150 DATA 3B2F3034292F2E3D00346F002265
   67696E0026726F6D002C617374002C6F636174
   696F6E0000003B333021232522,851
XP 1160 DATA 21323D00346F00306175736 50C00
   216E79002B657900346F00326573756D650000
   0000000000000000000003B25,178
RE 1170 DATA 33233D00346F0021626F72740000
   00000000000000000000000000000000357365
   002A6F797374696368002 96E00,18
NQ 1180 DATA 306F72740003110 0346F002D6F76
   650000000000000000035736500347269676765
   7200346F00227261686500216E,667
HT 1190 DATA 6400256E657267697A6500000000
   0000000000000000000000000000276F6F6400
   2C75636B01000000000000000000,622
TH 1200 DATA 000000000000000000000000000000
   00000000000000000000000000000000000000
   000000000000000000000000,0
AE 1210 DATA 000000000000000E000000488A48
   AD53248D55241869018D5324AD54248D562418
   69018D5424A278AD5524186901,893
TC 1220 DATA 8D55248D0AD48D16D0AD56248D17
   D038E9018D5624CAD0E2A90E8D0AD48D17D0CE
   5724F008AD57248D04D4D02EA9,423
VC 1230 DATA 048D57248D04D4AD07211869018D
   0721AD082169008D0821C923D011AD0721C996
   D00AA9E88D0721A9218D082168,963
RM 1240 DATA AA68400000000000A9E88D0721A9
   218D0821A9048D04D48D572420FB27A207A900
   9D00D0CA10FAA208BDC8239D12,488
KC 1250 DATA D0CA10F7A9EC8D02D4A9208D03D4
   A9D18D0002A9238D0102A9C08D0ED4AD1FD0C9
   06F009C903D0F5A9FF8D0F3120,773
JH 1260 DATA FB27A9408D0ED4A208A9009D12D0
   CA10FA6070707070707046D726F008080808080808
   08700080808080808087056DD24,978
YQ 1270 DATA 41BE24000000000000000000000000
   000000000000000000000232F2E27322134352C21
   34292F2E33002F2E00232F2D30,228
SI 1280 DATA 2C2534292E2700392F3532002D29
   3333292F2E00212E24003225232F362532292E
   270034282500332536252E002C,737
RC 1290 DATA 2F3334002A2537252C3300000000
   00000000332F002E2F3700272F002F35340021
   2E240034322521340039 2F3532,446
IU 1300 DATA 33252C2600342F00342825002E25
   37002A253428322F0034352C2C00212C22352D
   000223322533340 02F26002100,551
VH 1310 DATA 2B2E213625020022252321353325
   00293400293300223229 2C2C29212E34010000
   000000000000002900282F302500,279
DF 1320 DATA 392F3500252E2A2F39252400302C
   2139292E270002282521363900 2D2534212C02
   0021330034282933002933003 0,611
KU 1330 DATA 322F2221222C39002D39002C2133
   340025292728340022293400303 22F2732212D
   01000000000000000000030322533,416
GL 1340 DATA 3300212E39002B253900342F0032
   253435322E00342F003428250034293 42C2500
   33233225252E0000000000000000,421
KD 1350 DATA 000000000000000000000000000000
   000000000000488A48AD53248D55241869018D53
   24AD54248D5624186901 8D5424,173
LQ 1360 DATA A278AD5524186901 8D55248D0AD4
   8D16D0AD56248D17D038E9018D5624CAD0E2CE
   5724F008AD57248D04D4D02EA9,211
TI 1370 DATA 088D57248D04D4ADD8241869018D
   D824ADD92469008DD924C926D011ADD824C949
   D00AA9DD8DD824A9248DD92468,369
XT 1380 DATA AA68400000 2D293333292F2E0023
   2F2D302C2534250000000A0285554A000500000
   00A0285000A00050000000A028,334
QY 1390 DATA 5000A00050000000A2285550A000
   50000000AAA85000A0005000000 0A8A85000A0
   0050000000A0285554AAA85554,117
AP 1400 DATA 000055502AA05014AAA800005014
   A0285414A000000005014A0285514A000000050
   14A0285154AAA000005014A028,29
JQ 1410 DATA 5054A00000005014A0285014A000
   000055502AA05014AAA800A9008D00D28D02D2
   8D01D28D03D2A9DD8DD824A924,256
YV 1420 DATA 8DD924A9008D04D48D5724A24B20
   FB27200128CA10F720FB27A207A9009D00D0CA
   10FAA2089D12D0CA10FAA98E8D,303
DB 1430 DATA 02D4A9248D03D4A95D8D0002A926
   8D0102A9C08D0ED4A9FF8DFC02ADFC02C9FFF0
   F9A9FF8DFC0260A90085CBA968,143
SU 1440 DATA 85CCA900A238A00091CBC8D0FBE6
   CCCAD0F660AD0BD4D0FB60AD0BD4F0FB600240
   7EBCFA3876B44482C0FE3C7AB8,5
EV 1450 DATA F686C402407EBCFA38C8064482C0
   FE3C7A0A4886C402407EBC4C8AC8064482C0FE
   8ECC0A4886C40240D00E4C8AC8,610
BM 1460 DATA 0644828C8D8E8F909293948D8E8F
   909293949 58E8F9192939495978F9192939495
```

```
   979891929394969798999929394,500
CF 1470 DATA 969798999A9394969798999B9C94
   969798999B9C9D00010002010003020100 0403
   0201000504030201000605040 3,247
IY 1480 DATA 02010007060504030201000706 05
   0403020107060504030207060504030706 0504
   07060507060700000100010200,175
CJ 1490 DATA 01020300010203040001020304 05
   000102030405060001020304050607010203 04
   0506070203040506070304 0506,153
NE 1500 DATA 07040506070506070607070706 0F
   050E17040D161F030C151E27020B141D262F 01
   0A131C252E370009121B242D36,844
UI 1510 DATA 3F08111A232C353E1019222B34 3D
   18212A333C2029323B28313A303938FFFC3F FF
   FFF00FFFFFC003FFFF0000FFFC,296
YZ 1520 DATA 00003FF000000FC00000030000 00
   00C0000003F000000FFC00003FFF0000FFFF C0
   03FFFFF00FFFFFFC3FFF0003C0,278
HE 1530 DATA 00000FF000003FFC0000FFFF00 03
   FFFFC00FFFFFF03FFFFFFC7FFFFFFE1FFFFF F8
   07FFFFE001FFFF80007FFE0000,816
TX 1540 DATA 1FF8000007E000000180000003 C0
   00000FF000003FFC0000FFFF0003FFC3C00F FF
   0FF03FFC3FFC7FC0FFFE1FC0FF,972
IA 1550 DATA F807C03FE001FFFF80007FFE00 00
   1FF8000007E000000180000003C000000FF0 00
   003FFC0000FFFF0003C3FFC00F,328
FF 1560 DATA F0FFF03FFC33FC7FFF03FE1FFF 03
   F807FC03E001FFFF80007FFE00001FF80000 07
   E000000180000003C000000C30,929
OQ 1570 DATA 0000300C0000C003000300 00C00C
   028030300A000C402A8802100AA00800402 8020
   01000080000400200010080000,725
EY 1580 DATA 042000000018000A200A000B1C D3D
   47291D832991CDE8C8C004D0F0A5CD186928 85
   CD9002E6CEE03CD0DF608A48A5,314
DJ 1590 DATA CB85CD38E92885CBA5CC85CEB0 02
   C6CC20732ACE012010E768AA60AE0220BD61 45
   85CFBD84458 5D0A048B1CF9912,960
TE 1600 DATA D088C04010F68D002020213AA2 00
   BDC7280A0A0A7D8728A8B9072885CBB94728 85
   CCBD0729A8B1CF4829C0F051C9,63
RA 1610 DATA C0F02AC980F01368293F99007 88D
   0120A9BF8D7D2AA9294C332B68293F990078 8D
   0120A9F88D7D2AA9294C332B68,632
TU 1620 DATA 293F9900788D0120A9378D7D2A A9
   2A8D7E2A20972AA9838D7D2AA9298D7E2A4C 50
   2B689900788D012020972AE8E0,386
OD 1630 DATA 40F0034CD62A60AD03208D0520 AD
   04208D06200A0A0A6D0520A8B900788D0720 AD
   0520186D06200A0A0A69448D0A,73
LP 1640 DATA 20A90738ED0520186D06200A0A 0A
   696538ED07208D0B20A9008D0D208D11208D 0E
   208D1320A90F8D15208D14204C,32
SV 1650 DATA 293BA049B1CF8D1E20100160C8B1
   CF8D1F200A0A0A6D1E20A8B900788D1B20AD1E
   20186D1F200A0A0A69448D1A20,528
HJ 1660 DATA A90738ED1E20186D1F200A0A0A69
   6538ED1B208D1920A9008D16208D17208D1820
   4CFA2DAE1320E8E028D002A200,734
OV 1670 DATA E006100A8D302C85CB8D362C85CC
   8E1320AD0A208D00D0A009AE0B20B1CB9D007C
   CA8810F7603C46505A646E2C2C,596
TF 1680 DATA 2C2C2C2C003C5EBFBFFFFF7E3C00
   003C6EDFDFFFFF7E3C00003C76E7EFFFFF7E3C
   00003C76FBFBFFFF7E3C00003C,500
HA 1690 DATA 7AFDFDFFFF7E3C00003C7EFFFFFF
   FF7E3C00AD0D20F01AAD0A20186D0F208D0A20
   AD0B20186D10208D0B20CE0D20,610
QZ 1700 DATA 4C002CAD1120F020AD0B20186D12
   208D0B20AD072038ED12208D0720CE1120AD11
   208D20204C002CAD15201005A9,150
MA 1710 DATA 008D1520AD0E20F037C904D019AD
   0520186D08208D0520AD0620186D09208D0620
   A9078D2120AD0A20186D0F208D,189
WE 1720 DATA 0A20AD0B20186D10208D0B20CE0E
   204C002CAD10D0D018AD06200A0A0A6D0520A8
   B1CF29C0C9C0D003EE0C204C53,841
WP 1730 DATA 2DAD00D3290FC90FD003AD1420A2
   008E08208E0920C906F024C90EF020C909F02F
   C90DF02BC905F038C907F034C9,831
HR 1740 DATA 0AF043C90BF03FA90F8D14204C00
   2C8D1420AD0520C907F0EEA2018E0820A0FFD0
   338D1420AD0520F0DDA2FF8E08,868
RE 1750 DATA 20A001D0228D1420AD0620C907F0
   CAA2018E0920A001D00F8D1420AD0620F0B9A2
   FF8E0920A0FF8E0F208C1020AD,613
QB 1760 DATA 0620186D09200A0A0A186D052018
   6D0820A8B9007838ED0720300EC9081020 8D11
   20A9FF8D1220D01649FF186901,213
PJ 1770 DATA 8D1120A2018E1220C9103005A9FF
   8D1520A9048D0D208D0E204C002CA90F8D1420
   4C002CAD1A208D01D0A00FAE19,551
IM 1780 DATA 20B9102E9D007DCA8810F660000F
   0F0F0F0F77DFBFBFFFFFFFFFF7700AD1E201001
   60AD1620F00CCE1920EE1820CE,788
QY 1790 DATA 16204CFA2DAD1720F01AAD1A2018
   6D1C208D1A20AD1920186D1D208D1920CE1720
   4CFA2DAD1820F00CEE1920CE18,805
WH 1800 DATA 20CE18204CFA2DA9078D2120AD1E
   20CD05203013AD1F20CD06203029AD1E20CD05
   20D013F02F60AD1E20C907F0F8,177
TW 1810 DATA EE1E20A201A0FFD02AAD1E20F0EA
   CE1E20A2FFA001D01CAD1F20C907F0DAEE1F20
   A201A001D00CAD1F20F0CCCE1F,583
WX 1820 DATA 20A2FFA0FF8E1C208C1D20A9088D
   1720AD1F200A0A0A6D1E20A8B9007838ED1820
   300E1869088D1620A9088D1820,670
OV 1830 DATA 4CFA2D49FF1869098D1820A9088D
   16204CFA2DA009AE0B20BD007C51CB9D007C8A
   38E5CDAA8810F060A90185CDA9,4
GS 1840 DATA C085CEAD0AD229F78D1AD0AD0BD4
   D0F320FD2EE6CDAD0B201869048D0B2020FD2E
   AD0AD28D00D229E0090F8D01D2,449
VB 1850 DATA AD0AD229F78D1AD0AD0BD4F0F3C6
   CED0C4A9008D00D28D01D2A048B1CF8D1AD020
   FB2760A9008D0C2020FB2720E2,958
OM 1860 DATA 2760AD09D28DFC02684020FB27A9
   008D0ED2A9768D0802A92F8D0902A9408D0ED2
   A9008D0ED48D00D4A207A9009D,734
QP 1870 DATA 00D2CA10FA20E227A9228D02D4A9
   208D03D4A9788D07D4A9118D1BD0A9038D1DD0
   20FB27A93E8D00D4A9008D0220,101
ES 1880 DATA A9078D0320A9008D04208D2A348D
   0C208D08D2A9038D0FD2A2069D5A45CA10FAA9
   008D08D08D09D08D0AD08D0BD0,570
IU 1890 DATA 8D0CD08D01D4A9E08D09D460A900
   A2009D007B9D007C9D007D9D007E9D007FE8D0
   EE60A2009A207E2F20D53BA900,75
LQ 1900 DATA 8D0F31205824207E2FAD0F31F012
   AD10318D0220AD11318D0320AD12318D042020
   D53B206A2F20B52A200F39205C,278
RA 1910 DATA 38200A30208020B03420153620
   073820592BA9008D2B348D2C348D20208D2120
   8D0E31A9FF8DFC02ADFC02C9FF,982
FK 1920 DATA F010C91CF054C921D003201331A9
   FF8DFC0220FB27AD0E3149FF8D0E31F0032078
   2C204E3B20202E205935208736,376
YQ 1930 DATA AD2A34C907D0062077274CE83020
   2D34AD1520D00F20B23B20033BAD00208D12D0
   4C5B3020D539AD1520D01B20B2,936
YO 1940 DATA 3B20132FAD02208D1031AD03208D
   1131AD04208D12314C2130AD0C20D00034C8330
   20B23B20943A4C4F3000000007,959
HD 1950 DATA 0020FB27A9808D02D4A9318D03D4
   A9408D1BD0A208AD0AD229F09D12D0CA10FAA9
   008D00D28D02D28D01D28D03D2,431
KZ 1960 DATA A2079D00D0CA10FAA9FF8DFC0220
   BB31ADFC02C9FFF0F620FB27A9228D02D4A920
   8D03D4A9118D1BD0A048B1CF99,226
KE 1970 DATA 12D088C04010F6A9FF8DFC022000
   2C4C07387070704F00680F0F0F0F0F0F0F0F
   0F0F0F0F0F0F0F0F0F0F0F0F0F,763
PZ 1980 DATA 0F0F0F0F0F0F0F0F0F0F0F0F0F0F
   0F0F0F0F0F0F0F0F0F0F0F0F0F41803120FB
   27A20DBD4F3285EDBD5D3285EE,550
HK 1990 DATA BD9C328DDD318DAA328DDE318A48
   A200A000BDFFFF91EDA5ED18692885ED9002E6
   EEE8E018D0EB68AACA10CAA20D,587
YS 2000 DATA BD40329D4132CAD0F7AE9B32E030
   D005A2008E9B32BD6B328D4132EE9B32A20DBD
   413230118D4F32187D41329D4F,12
QC 2010 DATA 329014FE5D32D00FBD4F32187D41
   329D4F32B003DE5D32CA10D860000000000000
   00000000000000000003D3E3F4041,91
OL 2020 DATA 4243444546474849 4A6A6A6A6A6A
   6A6A6A6A6A6A6A6A0000002828282 8D8D8D8
   D800002828285050788B0B0D8,242
KR 2030 DATA D8D80000002850788B0D8000028
   2828282828888B0D800000000B8D0E800183048
   607890A8C0D8F0323232333333,215
QA 2040 DATA 3333333333333333300000000008899
   AABBCCDDEEFFFFEEDDCCBBAA990000000000000
   0000008899AABB000D0E000F0E,102
HF 2050 DATA 0D0CBBAA9900000000000000000000
   8899AABBCC0D0EFFFFEEDDCCBBAA9900000000
   000000000008899AABBC00D0E00,960
GU 2060 DATA 0F0E0D0CBBAA9900000000000000
   00008899AABBCC0D0E0F0F0E0D0CBBAA990000
   000000000000000008899AABB0C0D,691
QM 2070 DATA 0E0F0F0E0D00BBAA990000000000
   000000008899AABB0C0D0E0F0F0E0D0CBBAA99
   0000000000000000000008899AABB,491
UA 2080 DATA 000D0E00FFEEDD00BBAA99000000
   00000000000008899AABB0CDDEE0F0F0E0D0CBB
   AA99000000000000000000008899,236
XG 2090 DATA AABB000D0E000F0E0D00BBAA9900
   00000000000000000008899AABB0CDDEEFFFFEEDD
   0CBBAA99000000000000000000000,544
VE 2100 DATA 8899AABB000D0E0F0F0E0D00BBAA
   9900000000000000000000008899AABBCC0D0E0F0F
   0E0DCCBBAA99000000000000000,888
YE 2110 DATA 00008899AABBCCDDEEFFFFEEDDCC
   BBAA9900000000000000000000000000000000
   0000000000000000000000000000,992
CH 2120 DATA 00000000000000000000000000AD
   0D20D007AD0E20C904F076AD23343034AD0520
   CD2434D02CAD0620CD2534D024,79
MK 2130 DATA A9288D2B3420F837A9FFAE23349D
   5A458D2334EE2A34AE2A34A93585E2A99885E3
   20583AAD0520CD1E20D015AD06,937
OP 2140 DATA 20CD1F20D00DAD1820C9081006A9
   008D152060AD0520CD0834D008AD0620CD0934
   F0EAAD0520CD1334D008AD0620,995
HB 2150 DATA CD1434F0DA60A04BB1CF8D083410
   0160C8B1CF8D09340A0A0A6D0834A8B900788D
   0C34AD0834186D09340A0A0A69,989
BK 2160 DATA 448D0D34A90738ED0834186D0934
   0A0A0A696538ED0C348D0E34A9008D0F348D10
   344CFD34AE1034E8E0043002A2,678
SY 2170 DATA 008E1034BD293585CDBD2D3585CE
   AD0D348D02D0A009AE0E34B1CD9D007ECA8810
   F760313B454F3535353500081E,323
BR 2180 DATA 737FEE6E783000003836 3B7EEC5C
   783000001C366F7EDC5870600000 0C3E3B765E
   E8F86000AD0834100160AD0F34,891
KN 2190 DATA F032C904D014AD0834186D0A348D
   0834AD0934186D0B348D0934AD0D34186D1134
   8D0D34AD0E34186D12348D0E34,279
XG 2200 DATA CE0F344CFD34A9008D0A348D0B34
   AD0AD22903F00DC901F019C902F023D0314CFD
   34AD0834C907F0F6A2018E0A34,797
WT 2210 DATA A0FFD02AAD0834F0E8A2FF8E0A34
   A001D01CAD0934C907F0D8A2018E0B34A001D0
   0CAD0934F0CAA2FF8E0B34A0FF,748
FK 2220 DATA 8E11348C1234AD0934186D0B340A
   0A0A186D0834186D0A34A8B90078CD0C34D005
   A9088D0F344CFD34A04DB1CF8D,752
VB 2230 DATA 1334100160C8B1CF8D14340A0A0A
   6D1334A8B900788D1734AD1334186D14340A0A
   0A69448D1834A90738ED133418,313
SE 2240 DATA 6D14340A0A0A696538ED17348D19
   34A9008D1A348D1B348D1C348D2034AD352C85
   CBAD3B2C85CC4C7236AD18348D,910
TW 2250 DATA 03D0A009AE1934B1CB9D007FCA88
   10F760AD1334100160EE2034AD20342901D003
   4C7236AD1A34F01AAD1834186D,324
UG 2260 DATA 1D348D1834AD1934186D1E348D19
   34CE1A344C7236AD1B34F020AD1934186D1F34
   8D1934AD173438ED1F348D1734,557
CY 2270 DATA CE1B34AD1B348D20204C7236AD1C
   34F037C904D019AD1334186D15348D1334AD14
   34186D16348D1434A9078D2120,681
NB 2280 DATA AD1834186D1D348D1834AD193418
   6D1E348D1934CE1C344C7236A9008D15348D16
   34AD0620CD14343043AD0520CD,509
AD 2290 DATA 1334301DAD0620CD1434D023F003
   4C7236AD1334C907F0F6A2018E1534A0FFD02A
   AD1334F0E8A2FF8E1534A001D0,64
DI 2300 DATA 1CAD1434C907F0D8A2018E1634A0
   01D00CAD1434F0CAA2FF8E1634A0FF8E1D348C
   1E34AD1434186D16340A0A0A18,383
JT 2310 DATA 6D1334186D1534A8B9007838ED17
   34300EC90C10238D1B34A9FF8D1F34D01149FF
   186901C9191010 8D1B34A2018E,887
DF 2320 DATA 1F34A9048D1A348D1C344C7236AE
   21348E07D0E8E88E06D0E8E88E05D0E8E88E04
   D0A00DAE2234B9EA379D007BCA,402
AW 2330 DATA 8810F66008081C1C362E6F7F3E3E
   1C1C0808A00DAE2234A9009D007BCA8810F960
   A04FB1CF8D2334100160AABD5A,94
SI 2340 DATA 4510048D233460BD4C458D24348D
   53458D25340A0A0A6D2434A8B900788D2634AD
   2434186D25340A0A0A69448D21,338
CL 2350 DATA 34A90738ED2434186D25340A0A0A
   696538ED26348D22344CC537A050B1CF8D2734
   C8B1CF8D2834A9B785E2A93885,747
AZ 2360 DATA E3A91B85E4A99B85E5A20AA007B1
   E291E48810F9A5E2186908 85E29002E6E3A5E4
   18692885E49002E6E5CA10DEAE,618
HT 2370 DATA 2734A97485E2A99D85E320583AAE
   283420583AA94F8D293460AAA8AA8A80A8AAA8
   95589589625895 58A9A8A68959,576
QE 2380 DATA 589AA80980260955589800098026
   0995989AA009802609A698956009802609889 8
   9AA0098026098098980009 80A6,170
LZ 2390 DATA 8980989AA8098095898009895580A
   80AA8A80A8AAA8A95185E2A93985E3A95185E4
   A99E85E5A20AA00BB1E291E488,509
GL 2400 DATA 10F9A5E218690C85E29002E6E3A5
   E418692885E49002E6E5CA10DEAE2A34A93585
   E2A99B85E34C583A5555155515,779
CE 2410 DATA 151555150015556AA91AA919191A
   A919001AA95559195519191955190019550019
   1900191919001900190000191 9,993
XD 2420 DATA 5419191954190019550019 1AA419
   591AA419001AA900191954199919541900155 9
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METAL

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541919001AA919001900001965,178
HQ 2430 DATA 5919551A6919551955155595AA51A
A919591AA91AA91AA91554155515151555155
1555CE29341019A9148D2C34A9,315
IY 2440 DATA 4F8D2934AD2834D00BAD2734D017
A9008D152060CE2834AE2834A97785E2A99D85
E34C583AA9098D2834CE2734AE,752
AS 2450 DATA 2734A97485E2A99D85E320583AAE
28344C583AA9F085CBA98185CCA92C85CDA93D
85CEA208A000B1CD91CBC8C0C8,239
HW 2460 DATA D0F7A5CB1869C885CB9002E6CCA5
CD1869C885CD9002E6CECAD0DC60BDBD3B85E4
BDC73B85E5A20FA002B1E491E2,135
DR 2470 DATA 8810F9A5E418690385E49002E6E5
A5E218692885E29002E6E3CA10DEA5E238E97D
85E2A5E3E90285E360AD10D0F0,738
WR 2480 DATA FB20293BA200BDA745CD0220F007
300160E84C9E3ABDF445CD0520D0F4BD4146CD
0620D0ECBD8E468D0220BDB46,386
SP 2490 DATA 8D0320BD28478D042060AE1320E8
E028D002A200E006100ABD302C85CBBD362C85
CC8E1320AD0A208D00D0A009AE,439
BY 2500 DATA 0B20B1CB2D0AD29D007CCA8810F4
60A2468A4820FB27AD0AD28D12D08D00D2A98E
8D01D220012868AACA10E5A900,164
AP 2510 DATA 8D00D28D01D260A2318A4820FB27
20D03AAD0AD2291F8D00D2A9AE8D01D260AACA
10E6A9008D00D28D01D260AD2B,257
DL 2520 DATA 34F006CE2B344C613BAD2C34F00E
CE2C340A8D00D2A9A88D01D2D018AD2020F00D
0A0A0A8D00D2A9A88D01D2D006,712
OT 2530 DATA 8D00D28D01D2AD2120F00F0A0A0A
8D02D2A9888D03D2CE212060AD0834300CAD0A
D28D02D229E78D03D260A9008D,676
GY 2540 DATA 02D28D03D260A203A9009D00D2CA
10FA606C9CCCFC2C5C8CBCEC1C434343434444
4444444500000000A2008ED33B,626
OB 2550 DATA E88ED13BA0EDA23BA906205CE4A9
408D0ED460CED13BD02DA9A08DD23BA90C8DD1
3BAED33BBD363CE8E0F6D002A2,360
RT 2560 DATA 00C9FFD00CA9A88D05D2BD363C8D
04D2E88DD43B8ED33BAED23BE0A8F004E88ED2
3B8E07D2ADD43B8D06D24C62E4,367
PQ 2570 DATA FF9023282FFFA2282D35FF902328
2FFFA2282D35FF60404851FF5B404851FF6040
4851FF5B404851FF88322A323C,7
LP 2580 DATA 48FFA23C323C4851FF9028231FFF
A22F3539FF9028231FFFA22F3539FFF3798890
FFE699ADB6FFF3798890FFE699,399
JN 2590 DATA ADB6FFCCA2885BFFCDA28866FFCC
A2885BFFCDA28866FFF3798890FFE699ADB6FF
F3798890FFE699ADB6FFCCA288,312
KT 2600 DATA 5BFFCDA28866FFCCA2885BFFCDA2
8866FFE68880728088FFCC7972667279FFE688
80728088FFCC7972667279FF99,383
BO 2610 DATA 80724CFF90796C48FF9980724CFF
90796C48FF60322A1DFF5B21252FFF60322A1D
FF5B21252FFFE67290886CFFD9,773
ZQ 2620 DATA 6C888066FFE67290886CFFD96C88
8066000000000000AA8AA2AAAA82AAA82AA2A8
AA8AA00AA8AA8AAAAA2AAAA82A,773
IK 2630 DATA AA82AA000000000000000000000000
00009589625555 8A555A2562589488200 80A95
89555625555 8A555A256000000,59
WK 2640 DATA 00000000000000000000000095896255
5589555625625880 8AA00A80018 95556255558
9555625600000000000000000,586
ZY 2650 DATA 0000000095896255555895556242 2
08AA8AA00AAAA8880556255558955562560000
0000000000000000000009589,897
NV 2660 DATA 62555589555620A2A8AA8AA00AAA
AA8A8016255558955562560000000000000000
00000000009589625 6AA895A92,685
MH 2670 DATA 2AA2A8AA8AA00AAAAA8AAAAA2A96
A895A96256000000000000000000000000095
8962560000958822AA2A8A88820,935
OG 2680 DATA 080AAA8AA80000960095 89625600
0000000000000000000000009589625600095 8
AA2AA2A880896009400 28AA800,965
RU 2690 DATA 0096009589625600000000000000
00000000000095896256000908AA2AA20895A9
600965648AA8000096009589 62,953
ZH 2700 DATA 5600000000000000000000000000
95896256000828AA28225895556009 69A58808
00008600958962560000000000,293
ZO 2710 DATA 000000000000000000958962560000A
A8AA20625895556009622589480000A2009589
6256000000000000000000000,351
EK 2720 DATA 00009589625 6000AA8822 56258A5
55A00960258 95AA800AA009589625600000000
000000000000000000958962 56,58
UL 2730 DATA 000AA89625625829568009602589
555800AA0095896256000000000000000000000
000009589625600 0A8A962562,801
RG 2740 DATA 580A5A000960258955580 0AA0085
896256000000000000000000000000000958962
520000815562562580258000960,263
RV 2750 DATA 2589555 8008A0081896256000000
0000000000000000000958962 42AA09555625
625802580009602589555 80082,630
ON 2760 DATA 00A0A96256000000000000000000
000000009589622AAA09555625625802580009
6025895AA8009600AA15625600,664
WG 2770 DATA 00000000000000000000000095A9
62AA820955562562580258000960258958 0000
9600AA8062560000000000000,208
EK 2780 DATA 000000000000955522AA06095A96
2562580258000960258958000096 00AAA82256
0000000000000000000000000,981
DZ 2790 DATA 955422A8560958962562580258 00
09602589580000960 08AAA2256000000000000
000000000000009550A2A2AA09,758
CH 2800 DATA 5896256258025800096025895800
0096009 2AAA25600000000000000000000000
009542A206000958962562 5802,487
JF 2810 DATA 58000960258958000096009 48AA2
56000000000000000000000000095AAA21600
0958962 56A58025800096025 89,489
ZD 2820 DATA 5AAA0096009 58AA21600000000000
000000000000000948AA25600095896255558
02A8000AA02A895556009 60095,861
XQ 2830 DATA 8AA2060000000000000000000000
0000908A22560009589625555800000000000
0955560096009588228 2000000,944
YY 2840 DATA 000000000000000000008A886256
0009589609556000000000000009555600 9600
958962AA000000000000000000,779
DA 2850 DATA 00000000AA8962560009589 60255
8000000000000000955560096009589 62AA0000
000000000000000000000AA89,144
JE 2860 DATA 625600095896 00AA000000000000
000AAAAA009600958962AA00000000000000
00000000000AA89625600095896,393
ES 2870 DATA 000000000000000000000000000096
009589622A000000000000000000000000000A8
896256000958960000000000000,312
RO 2880 DATA 00000000000000009600958962 0A00
000000000000000000000000A08962 56AA8958
9600000000000000000000000000,570
WD 2890 DATA 0096009589624200000000000000
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000000000000000000AA00958962,164
CT 2900 DATA 52000000000000000000000000000
958962555580000000000000000000000000000
000000009589625600000000000,234
TT 2910 DATA 000000000000000000958962555580
00000000000000000000000000000000009589
625600000000000000000000000,152
DC 2920 DATA 000095896255558000000000000000
000000000000000000958962 56AA800000
0000000000000000000958962AA,4
XH 2930 DATA AA8000000000000000000000000000
0000000000AA8AA25555 80000000000000000
00000095896000000000000000,448
GB 2940 DATA 000000000000000000000000000000
00025555800000000000000000000000958960
000000000000000000000000000,682
BG 2950 DATA 000000000000000000000255558000
000000000000000000095896000000000000000
000000000000000000000000000,682
XZ 2960 DATA 000000025555800000000000000000
00000000AA8AA000000000000000000000000000
000000000000000000000002AAAA,110
FS 2970 DATA 80000000000001555507FFFF47FFF
F47FDFF47F47F47F47F47F47F47F47F47F47F4
7F47F47F47F47F47F47FDFF47F,417
UD 2980 DATA FFF47FFFF4155550005500007D00
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The ST FILE

May/June 1988

SPECTRUM 512
More colours than you can imagine

MASTERPLAN
The affordable spreadsheet?

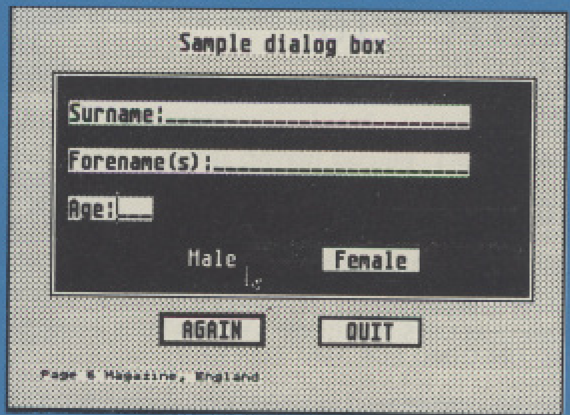


by M.S Rogers

GUNSHIP

Stacks of games reviews

DIALOG BOXES IN GEM



Program them yourself

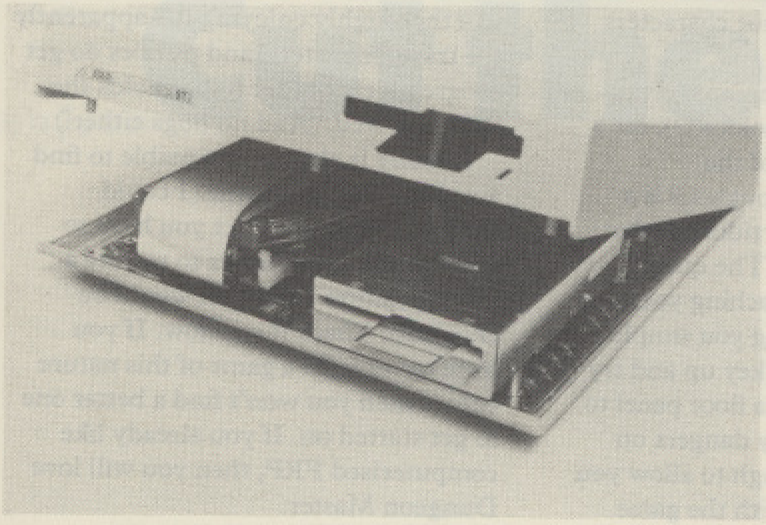
SEE ALSO

PRINTER FEATURE page 18

CONTACT page 81

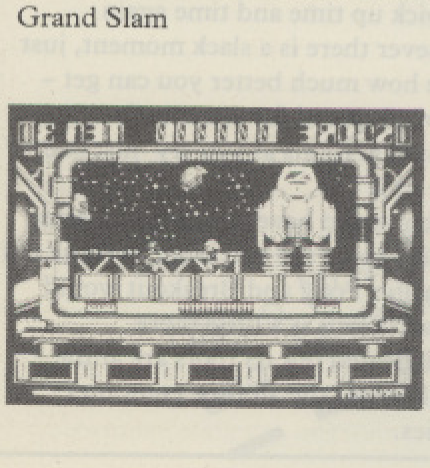
What's Happening

AB Software have recently signed up a distribution agreement with Ladbroke Computing for their range of budget priced software. Among the products already available are utilities and educational software including the first of a series for young children entitled **ADD WITH OSCAR** and **SPELL WITH OSCAR**. Programmers in GFA or FAST BASIC will find several useful programs including **PICSTRIP** which allows Degas or Neo pictures to be included in programs with ease and **AB ANIMATOR** which can supply animated sprites for use with these languages. All AB Software is at a budget price starting at £6.99.

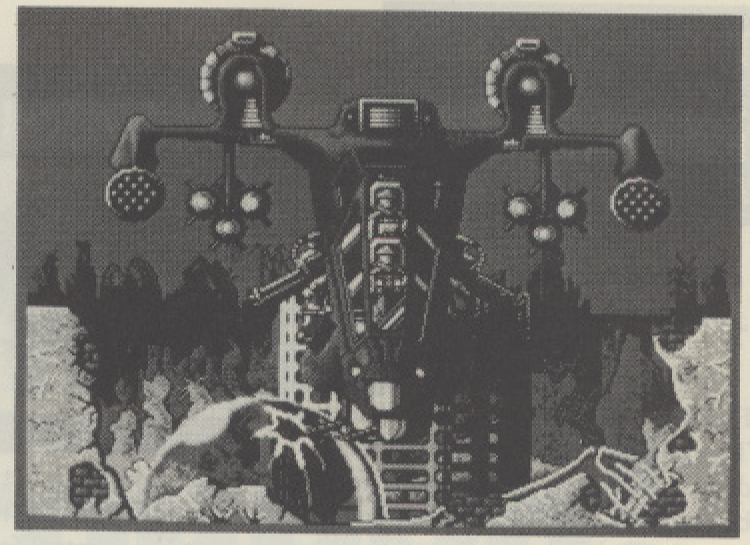


Frontier Software now have an inexpensive clock for the 520 and 1040 series called the **FORGET-ME-CLOCK** which retails at £22.95. This battery operated clock simply fits beneath the keyboard of your computer and, once there, can be forgotten. The correct date and time will always be available whenever you boot up and the batteries are recharged whenever the computer is on. The unit is priced at £22.95. Also from Frontier is an amazing new hard disk drive for the Mega ST which actually fits inside the case of the CPU. The **MEGADRIVE** from Supra will be available in 20Mb, 30Mb and 40Mb configurations and will offer all the same facilities as standard hard drives, except you won't see it! Prices start at £589.95 which includes dealer installation.

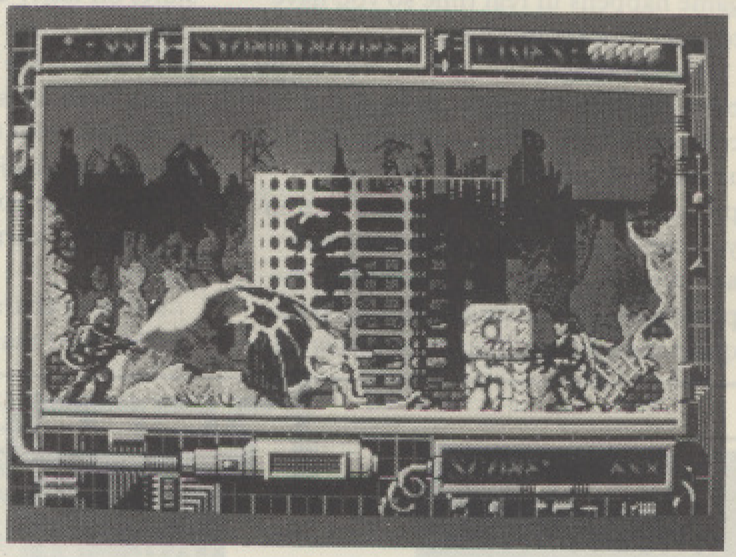
Other releases to look out for include **MINDFIGHTER from Abstract Concepts** an original adventure based on the book of the same name with digitised graphics and independent characters that do their own thing while you play. **Firebird**'s new budget releases include **I BALL, MISSION GENOCIDE, THRUST** and **WARHAWK** all for just £9.95. Others include **CAPTAIN AMERICA** from U.S. Gold, **MACH 3** from Elite, **ROLLING THUNDER** from U.S. Gold, **SCRABBLE DELUXE** from Leisure Genius, **TRANTOR** from Go! and **THE FLINTSTONES** from Grand Slam



Northstar from **Gremlin Graphics** should be out now.



Creation Software's second release is **STORMTROOPER** which is a futuristic arcade adventure featuring horizontal parallax scrolling and has 16 levels. If the gameplay is as good as the superb graphics then STORMTROOPER should be something really special.



Among the re-releases or revised versions ... **K-WORD 2** from Kuma which has been reduced in price to £39.95, **SAVED!** from Hisoft, which is now in Version 2 priced £29.95 and features a reset proof RAM disk, printer spooler, undelete utility and a multiple desk accessory to allow access to GEM features from within other GEM programs. Anco have **STRIP POKER 2 PLUS** for £14.95 which has pictures so good that they quickly dropped the original version 2! **TIME BANDIT** from Microdeal has also been re-released at a new price of £19.95.

QUICKLIST UPDATE

Quicklist, reviewed last issue, has been updated several times since the copy we had for review and is now available from Ladbroke Computing at a new price of £6.95.

AB Software tell us that several of the criticisms of the review have been attended to in the current version. The program can now read from any drive including hard drives and has faster sort facilities and, following comments in the review, has been further amended so that the keyboard can be used and the desktop is normal on exit. There is also now a FREE custom disk formatter with the program which makes it just as much a bargain at the new price.

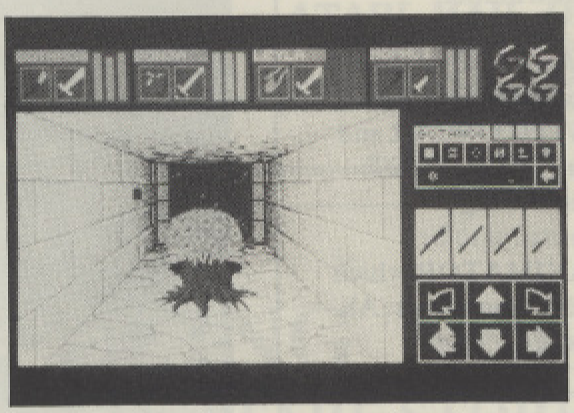
You can get a copy from Ladbroke Computing, 33, Ormskirk Road, Preston, Lancs, PR1 2QP.

DUNGEON MASTER
FTL/Mirrorsoft
£24.99

Reviewed by John Sweeney

Dungeon Master is a Fantasy Role Playing game of quite amazing quality. The graphics are superb, from the detailed corridor walls, which have to be carefully examined since they contain secrets such as levers, to the animation of the Dungeon's inhabitants as they attack you. The only bad thing about the animation is that it is so good you keep looking at it when you should be concentrating on your attack! The game happens in real time so you have to react quickly in a fight.

A great deal of thought has obviously been put into the ergonomics of the command input. By pointing at the appropriate part of the screen, and pressing the appropriate mouse button you can display vast amounts of data about your characters' status and possessions instantaneously, and issue quite complex commands to cast spells or pass items between your characters with the greatest of ease.



You control four champions (elves, dwarves, lizard-men, wookies(!?), etc.) in a quest to the depths of the dungeons. The view throughout is a view ahead down the corridor of what your champions can see.The quest starts off fairly easily, teaching you how the game works by giving you simple puzzles to solve – pick a key up and try it in a keyhole; stand on a floor panel to close a pit. Not too many dangers on the first level – just enough to allow you to familiarise yourself with the game system and learn how to cast your first spells.

All your characters can learn to cast spells. Your main problem is finding out what they are! The Dungeon Master manual is very easy to read and introduces you to the 'Dungeons and Dragons' concepts; it also teaches you how to cast your first spell. The rest you need to learn, either by experiment or by finding clues in the dungeon.

Of course any game can look good to start with – I haven't got very far yet, but I have checked with a friend who has had rather more time on it than me – he is down on the 12th level! He is still thoroughly enjoying it – apparently the traps, monsters, and puzzles do get progressively harder – so it holds the attention well. (And no bugs either!)

It really is almost impossible to find any fault with this game (I could complain about the fact you have to commit suicide in order to restore a saved position – but that would be churlish). Check it out now. If you have never tried a game of this nature before then you won't find a better one to get started on. If you already like computerised FRP, then you will love Dungeon Master.

Next issue will be an Adventure Special so look out for an in depth review of Dungeon Master. IF I manage to finish it by then!

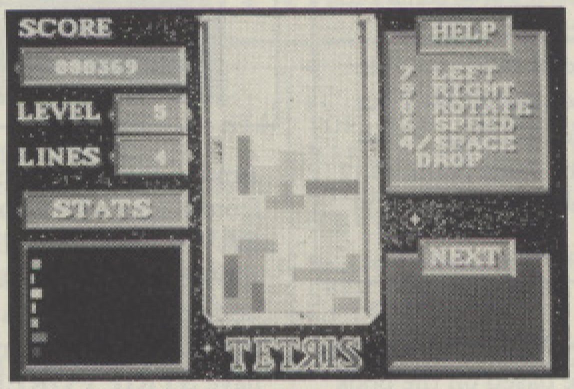
TETRIS
Mirrorsoft
£19.95

Reviewed by Les Ellingham

Computer games get more and more complex and it becomes more and more difficult to find a game that you can just boot up and play. Don't you sometimes long for the simple days? Remember when you used to keep going back to Breakout for just one more go? The trouble is that it is easier to write a complex storyline than it is to come up with a new idea for a simple game. All of the simple ideas have already been used, or have they?

Suppose you could find a game that was as simple to play as Breakout, as challenging and as addictive but was totally different? Surely you would be onto a winner? Well, Andromeda have come up with just this formula with Tetris and it surely must be a winner.

It's simple. In the middle of the screen you have a vertical column in which various geometrical shapes fall. All you have to to is rotate them and move them left or right so that when they reach the bottom of the column or another shape a solid line is formed. If you form a line, it disappears and all the remaining shapes drop down one line. If you leave gaps in the line then the shapes stack up on top of each other until they reach the top of the screen and you lose the game. If that sounds boring, believe me it's not! Your brain and fingers will be constantly working as you try to figure out the best position for the next shape, bearing in mind always that the one after must be slotted in. On the slowest levels it takes practice and by level 9 you need to play by sheer intuition – it may take you months to get that good!



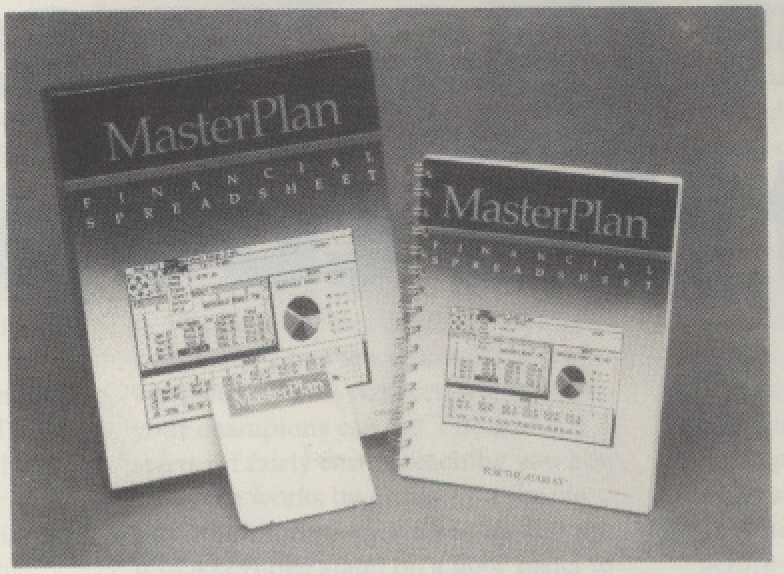
The shapes are controlled by the keypad which takes a little bit of practice, unless you are an ex-Spectrum owner(!), but once mastered control becomes almost automatic. The shapes can be rotated, moved left or right or quickly dropped – and that's about it, nothing more is needed. Simple in concept but difficult in execution. The game plays on both colour and mono systems. It is, in fact, easier to play in mono and is one of the few games that is just as well suited to both systems.

The packaging is appalling for a game costing £20 being just an inlay printed on the inside with instructions for four different machines but then there really isn't much to say in the way of instructions. In the long run you will almost certainly get your money's worth for this is one of those games you will pick up time and time again whenever there is a slack moment, just to see how much better you can get – and be prepared for some early morning sessions as you try 'just one more time'!

Who would have thought that after all these years the successor to those old favourites Pong and Breakout would appear! Tetris is a little more sophisticated but its roots are at the very heart of the all time computer classics.

MasterPlan

from Ditek International £99.95



Reviewed by John S Davison

For years now I've been a user of the ancient but excellent Visicalc spreadsheet package on the 8-bit Atari's, with occasional usage of the ubiquitous Lotus 1-2-3 on the IBM PC. Until now I've not had the chance to use a spreadsheet on the ST, so I was curious to see how this GEM based product from Ditek compared.

The package contains a 148 page spiral bound manual and a single sided disk. The manual isn't really up to scratch for a program of this price – all the material is there, it's just that you have to hunt around to find it. A proper index would help, as would a reference card of some description. The disk isn't copy protected, making backups and installation on a hard disk relatively painless. It requires 512K minimum to run, but large spreadsheets may need 1024K. This review was conducted on a 520STM with colour monitor, but it also works with monochrome systems.

LOTUS CLONE?

Although there's no claim anywhere in the packaging or documentation, MasterPlan is a partial Lotus 1-2-3 clone. It's not fully compatible as it doesn't have macros or database facilities, and has fewer features in other areas – such as built-in functions. VIP Professional is reputedly the nearest thing to Lotus on the ST, so I used a Page 6 public domain VIP template disk to check compatibility with both VIP and (hopefully) Lotus. The templates I tried did seem to load and work OK (except macros) once I had changed the filename extenders to .WKS.

After bootup you're presented with a blank worksheet. This doesn't quite take up the full screen as the top five lines include the menu line and a control panel area, which are always visible. Menus can be several layers deep, so two of the control panel items allow you to step back a menu layer or go straight back to the top level. Menu selection may be done with mouse or keyboard, with keystrokes using the same conventions as Lotus.

The control panel has a neat and compact layout and contains several mouse selectable action and status icons plus status and edit lines. The Express icon, looking like a collection of arrowheads, is used for rapidly moving around the worksheet in conjunction with MasterPlan's cell range facilities. Others allow you to do such things as invoking help, forcing recalculation, viewing a graph, and so on.

Worksheet capacity is massive, potentially holding up to 8192 rows by 256 columns assuming you have the memory to support it. Column width may be varied globally or individually to suit the needs of particular columns. I expected to be able to have multiple windows open on the worksheet giving simultaneous views of several different parts of it, but this isn't possible. Instead, the screen can be split horizontally or vertically permitting simultaneous viewing of just two different parts of the worksheet, with independent or synchronous scrolling of the two windows as required.

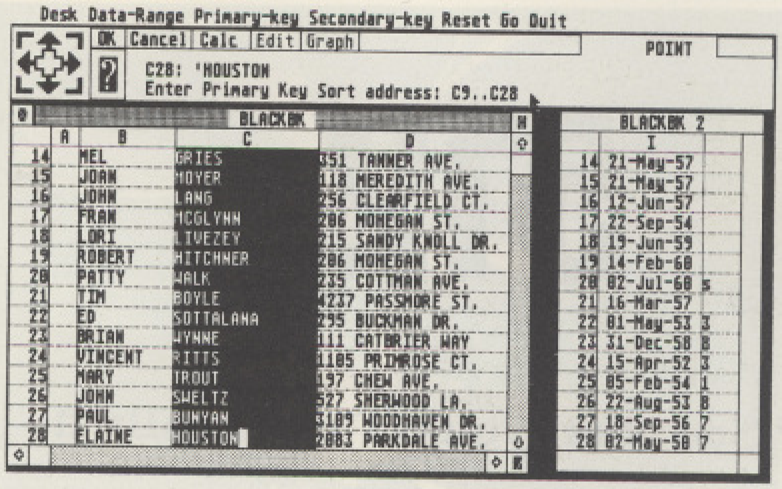
GOOD USER INTERFACE

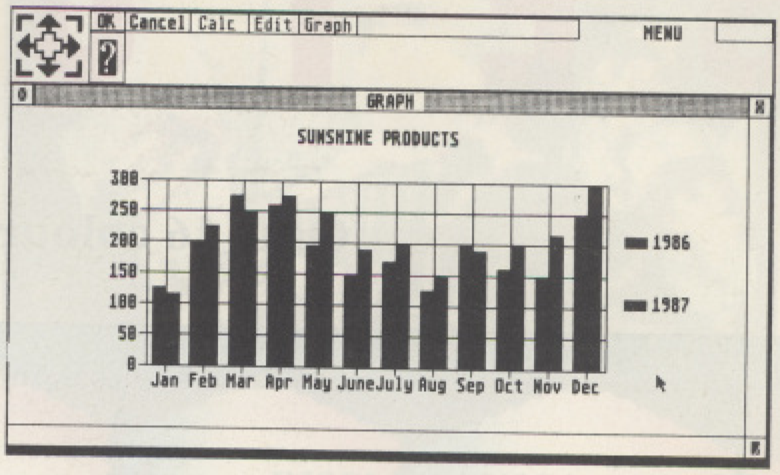
Much thought seems to have been put into the design of the user interface, with the mouse generally employed in sensible ways. For example, the right hand mouse button duplicates the Return key, allowing single click acceptance of defaults or confirming a requested command. In practice this should mean less switching between mouse and keyboard and a reduction in the amount of 'rodent rolling' required. Mouse usage isn't mandatory though, as there's usually keyboard or function key alternatives available.

Moving around the worksheet may be done in several ways – via the Express icon, GEM scroll bars, keyboard arrow keys, the GoTo function for jumping directly to a specified cell location, or simply by moving the mouse pointer. To help you keep track of what the rows and columns actually represent, the top and/or side titles may be frozen in place so they're permanently visible wherever you scroll the worksheet.

As with most spreadsheets, the cells can contain one of three different types of data, namely, values, formulae, or labels. Values are simply numeric values, and can have a wide range of formats. Different formats may be specified for different parts of the worksheet.

Formulae can calculate a numeric





value from parameters held elsewhere in the worksheet. A formula can also include one or more of MasterPlan's library of 46 built-in functions, which are a subset of those found in Lotus. They include financial, mathematical, logical, statistical, date manipulation, and other special functions.

The third type, labels, are used for entering constant data such as title lines, column and row headings and the like. In fact, you can type in complete sentences, or even paragraphs of explanatory text if you wish. Unlike some spreadsheets MasterPlan doesn't need you to manually chop up your text and enter it in cell sized chunks, but will take the whole string of input characters and automatically enter it into the appropriate number of cells (if they're empty). If any happen to be occupied, the current contents remain intact so you don't accidentally overwrite them. MasterPlan also has a general cell protection facility to prevent any accidental change to cells.

EDITING FEATURES

Setting up a worksheet can be very tedious unless you have decent editing features. MasterPlan is very good in this respect, having full cell editing facilities (including UNDO) and all the expected row/column insert, delete, copy, and move features. It also has cell range commands, allowing easy manipulation of defined ranges of cells. Copying and moving a range of cells may be done using the mouse, simply by dragging a box round the required cells and pointing to the target locations. Any cell references contained in the cell range may be automatically adjusted if required, and in addition you have full manual control over absolute and relative cell addresses.

MasterPlan has comprehensive file handling facilities allowing not only the normal loading/saving of complete worksheets, but also the saving of selected sections and combining of several different worksheets. Combining works on corresponding sections of two worksheets, permitting replacement of cells in one with those from the same location in another (excluding labels and empty cells). You can also add/subtract corresponding cells to/from the current worksheet, enabling you to quickly produce a summary worksheet from several others. You can also import files from programs other than MasterPlan in text, numeric, or mixed form.

Once you have your worksheet set up you can print a hard copy if required. MasterPlan will automatically divide the worksheet or selected part of it into sections that will fit the page format you specify. Page length, margins, headers, footers, and borders are all user adjustable. You can also send a string of control codes to your printer to select type style, font, etc., as required. One thing you can't do is print sideways on a page, which is sometimes useful for very wide worksheets. You can direct output to a printer or to a file, the latter allowing transfer of a worksheet to a word processing program or other utility.

TURN NUMBERS INTO PICTURES

MasterPlan has reasonable graphing facilities, allowing you to turn all those indigestible numbers into an easily understood pictorial form. Graph types include line, bar, stacked bar, and pie chart. These may be customised with various title, label, legend, grid, and scale options. Switching between graph types is very easy, so if a line graph proves inappropriate a few clicks will produce a bar chart in its place.

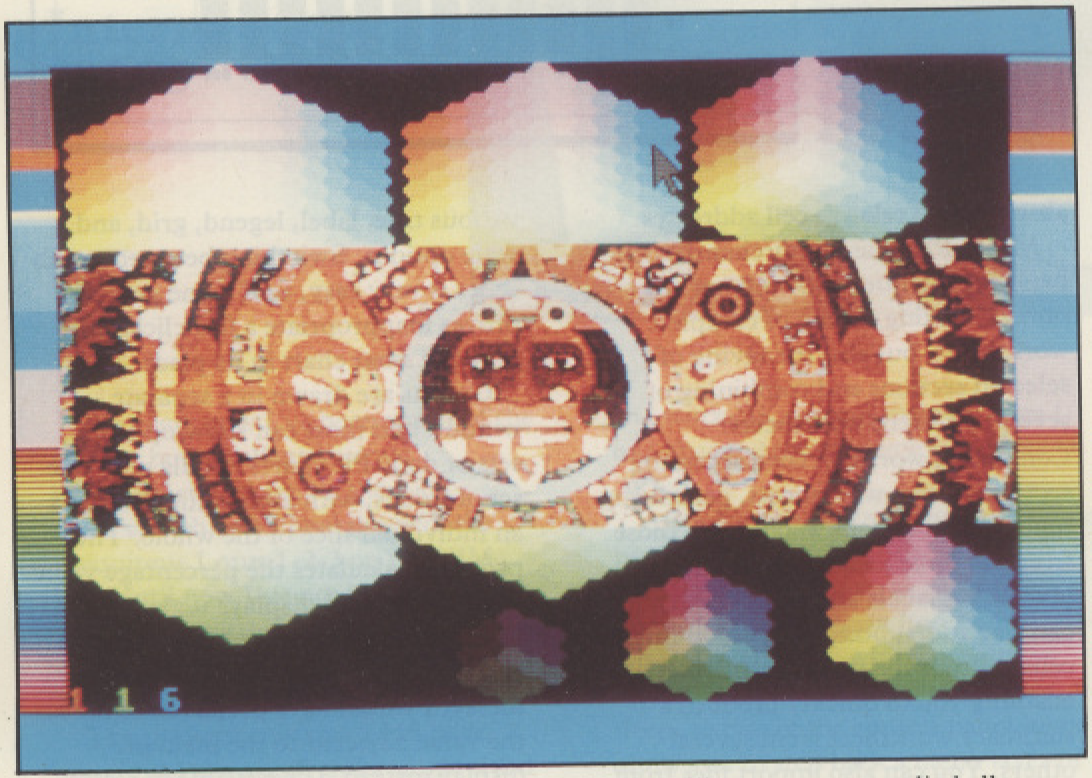
Graphs are drawn in a separate window and most can show up to six sets of data. Pie charts handle only one set of values, with each value shown as an individual slice of the whole. The program calculates the percentage value of each slice and displays it alongside the relevant legend symbol at the side of the main chart. To me this looks messy, I would have preferred to see the value adjacent to the main pie display instead. It's possible to resize worksheet and graph windows to display them side-by-side. Then, after making changes to worksheet values you can see the effect on the graph almost immediately.

Graphs may be dumped to the printer using the GEM screen dump facility. You can also produce a picture file on disk in DEGAS format, permitting the use of separate utilities for enhancement or display of your graphs. MasterPlan's graphing facilities aren't as good as a dedicated graphing program such as K-GRAPH, but are perfectly adequate for most purposes.

In summary, I liked MasterPlan. It's easy to use and has most facilities I need from a spreadsheet package. Ditek call it a financial spreadsheet, but I found it perfectly suitable for general use. It's a pity it doesn't have macros, though, as this reduces its flexibility. So, if you want a good Lotus-like spreadsheet, but don't need the power (or expense) of a full Lotus clone like VIP, then consider MasterPlan. It's probably just what you need. •

SPECTRUM 512

Only 16 colours? See what you ST can really do



512 usable colours on your ST's screen? All at the same time? Yes, it's now possible with this amazing new art package from ANTIC. There's no catch, it really does work. The screen shows rock solid, rich colours anywhere on a low resolution display, with no sign of flickering or other aberration. This near miracle is achieved through some extremely clever programming involving the timers in the ST's MMU chip. It also requires various chips in the ST to be accurately synchronised with each other. More of this anon.

The package received for review contained a high quality hardback ring binder containing a well written 95 page instruction manual, and one single sided disk. The disk contains Spectrum itself, slideshow, synchronisation, and picture format conversion utilities and a few sample pictures. It will run in 512K, but one megabyte gives additional flexibility.

Before using Spectrum you have to ensure the ST's chips are correctly synchronised with each other. There's no guarantee that this will always be the case when you switch on, so the small utility program supplied allows you to test it for yourself. If the sync is out you simply switch off, wait 15 seconds and switch on again and you'll usually find it's then OK. I had no problems with this, but beware if you have a machine released before December 1985, as early MMU chips won't work with Spectrum. An authorised Atari repair centre can fit a new one if required.

One thing ANTIC overlooked is that European ST's run at 50Hz rather than 60Hz. The review copy was sent directly from ANTIC in the States and was set for 60Hz which causes severe distortion of the screen display making it totally unusable. At first, I thought this was the MMU chip problem, but when running PAGE 6's Spectrum Classic Art Show public domain disk (containing examples of Spectrum pictures) everything worked fine. PAGE 6 has added a program to the disk which changes the Hz. It correctly sets the frequency on bootup and if you then load Spectrum itself it works perfectly. The problem should be solved when the program is made available here by Electric Distribution but check it out just in case.

Reviewed by
John S Davison

COLOUR MANAGEMENT

Spectrum's most obvious asset is its ability to put 512 usable colours on screen simultaneously. By usable I mean that you can draw with any colour at any time in any position on the screen. In fact there's a slight limitation in that you can't have more than 48 colours on one scan line, but practically this isn't a problem.

So many colours can be an embarrassment as they become difficult to manage. Spectrum handles this by having several different types of palette available. Custom palettes can be defined containing just the range of colours you want to work with, and may be saved and loaded as required. The floating palette allows you to select a colour and have Spectrum automatically provide the 26 shades closest to it. Alternatively, you can fix the palette and use an unchanging selection of shades, and you can even pick up colours directly from an existing picture. There's also a feature where you can specify two colours and Spectrum provides a palette of all the shades in between. All this is additional to the full, spectacular, 512 colour matrix palette which may be called up at any time!

Colour flexibility doesn't stop here, though. There are facilities for editing colours in existing pictures too, either in the whole picture or in a localised area of it. You can search and replace one or more colours with others, and add/subtract the red, green, blue, or overall luminance content of existing colours. So if you don't like an effect you've created it's easily changed.





NO STAIRCASES

Less obvious features are 'Anti-Aliasing' and 'No Zag', used to smooth out jagged staircase effects normally seen on lines or colour boundaries drawn diagonally across the screen. Anti-alias processing may be selectively applied to any part of a picture, and works on colour boundaries as well as just lines. Other options allow it to increase the contrast between adjacent coloured areas and to add a misty, blurred effect to pictures.

No Zag does a similar thing for line drawing, but the processing takes place immediately the line is drawn. No Zag also smoothes out sharp angles in lines, so if you draw a zig-zag line it reprocesses this to a smooth continuous curve. Similarly, polygons may be reprocessed to form shapes with smoothly curved outlines.

Both Anti-Aliasing and No Zag work by what is really an optical illusion. They fill in the areas immediately adjacent to the offending jagged edges with subtle multicolour shading. The effect can be seen quite clearly if you examine a processed area using Spectrum's picture magnification facility. To work properly it requires a large number of shades, which Spectrum has, of course. It really does work – those hard jagged lines do look considerably smoother, but there's also an overall softening effect which you may not always want.

Spectrum has three different fill facilities. The first works as you'd expect, filling enclosed areas with solid colour or pattern. The second is Fill To New, which only stops when it finds the colour currently selected, allowing actions such as pattern fill of an area already containing a pattern. The final one is called Gradient Fill, and this automatically fills a given area with a graded range of colors from a palette defined by you. A number of options let you control the smoothness of the effect.

OFFSET PATTERNS

Spectrum's other features may be found in most art programs. There are freehand line, straight line, multi-line, polygon, circle and ellipse drawing facilities with a choice of 38 different brushes provided. These can paint with any of the 512 colours, or with any of the 40 supplied patterns or custom designed patterns. The 'offset pattern' feature allows you to paint over the same area twice with the same pattern, with the second application being offset thus creating a new pattern. There's also a nice airbrush feature, with four different spray nozzles and nine flow rates. 'Undo' is available to cancel the effect of your last action.

Cut and paste facilities are provided through the block options. These use a buffer area to hold the blocks, there being enough buffer space to hold two complete pictures on a 520ST, and twelve pictures on a 1040ST. You can scroll through the buffer to pick out any of the blocks you previously put there and paste them back anywhere into the original or another picture. The buffer can also be edited, saved, and loaded from disk.

Before pasting a block into a new location you can rescale, stretch, compress, or flip it vertically or horizontally. Spectrum doesn't have the more advanced block distortion features of programs such as Art Director, but I doubt whether most people would miss these anyway.

DISPLAY AMIGA PICTURES

In addition to its own file format, Spectrum can load pictures in DEGAS or NeoChrome formats. It also reads Amiga low resolution and Hold And Modify (HAM) format pictures, as available on certain bulletin boards. When displaying HAM pictures, Spectrum uses a dithering algorithm permitting over 3000 colours to be effectively simulated on the ST's screen. It will also write pictures in DEGAS format, but you lose the colours, of course. You could use this to transfer Spectrum pictures to other utilities – a printer dump for instance, as Spectrum doesn't have one at present.

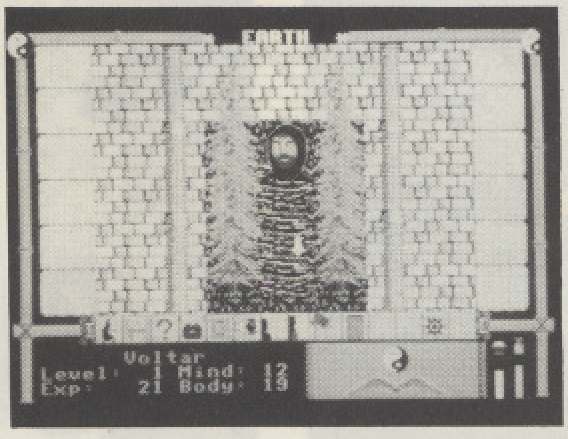
Spectrum places a heavy demand on the processing power of the ST so one or two tricks have been employed to speed things up, including occasional temporary switching off of full colour mode. This doesn't interfere with the program's usability in any way, but it can be disabled if you wish, with the penalty of increased response times. Overall response is fast with the exception of Gradient Fill, which can sometimes take minutes to process a large area. However, the spectacular effects it can produce are well worth the wait.

Spectrum 512 is a magnificent achievement, representing a major step forward in art programs for the ST. It's impossible to do it full justice in a magazine review, you really have to see it in action. And when you do, you won't believe your eyes!

Spectrum 512
ANTIC
Distributed by
Electric Distribution
£79.95

MOEBIUS
Origin Systems/ Microprose
£24.95

Reviewed by Ron Stewart



In the year of the Yak, the disciple Kaimen abandoned the true path of Moebius the Windwalker and stole the 'Orb of Celestial Harmony'. The ensuing months have brought ruin to the land of Khantun and as a disciple of the Windwalker it is your task to restore the orb. To do so you must train hard and travel many miles and fight many battles in the four realms of earth, air, wind, and fire.

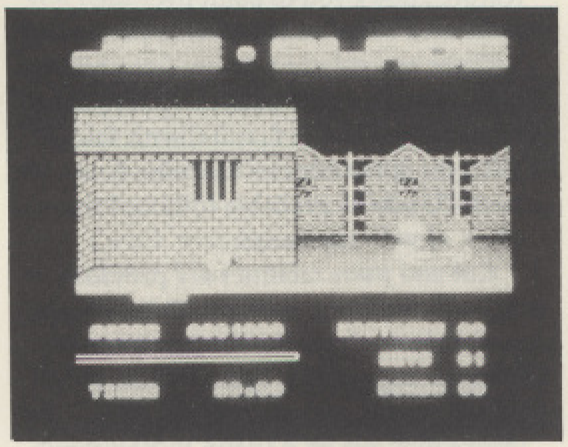
Moebius is a martial arts graphic adventure game in the mould of the Ultima series. You control a character, utilising the resources and magic available to you. First you will have to name and train your disciple who is allocated certain characteristics when he/she is created. The training is hard and the opponents tough. As I have travelled through the land I have come across none tougher except, perhaps, for the evil overlords. As this is a martial arts game your training will include armed and unarmed combat. After you have completed training you may enter the world of Khantun. Here you will travel the land, defeat evil monks and assassins, as well as collecting artifacts and magic spells. As you go, Moebius will look over you. Slaying the evil ones will increase your experience points and thereby increase your level. Do anything rash and your karma and dexterity will falter and your actions will be more difficult to carry out. Moebius will frequently visit you and restore your mind and body. Should you fall to an assassin or guard he will restore you from the dead, but only three times.

Game control is by icon or keyboard. Generally, I found the mouse easier to use, especially during a fight. The screen itself is split into two. The lower third being the control icons, while the upper portion shows your movements about the land or the fight graphics. Fight scenes use large figure graphics. Should your body take too much punishment you can cut and run but only at the expense of your karma. Mapping is carried out for you as you travel through the game. Maps are drawn either from your character's memory or by using lenses which tell you the location of specific objects.

Let's be quite clear that Moebius will not be over in a couple of hours or even days. To complete the tasks will take a lot of playing time. Origin estimate fifty to one hundred hours. I would judge that to be a conservative estimate. The graphics are much improved over the 8-bit games, but still remain a little chunky. The sound is a little repetitive but can be turned off in stages, finally leaving only the sound effects. As I stated earlier Moebius bears comparison with the Ultima series. If you are used to Ultima then Moebius could be a little too easy for you. I recommend it as an absorbing challenge. This one also works on Mono monitors.

JOE BLADE
Players
£9.95

Reviewed by Ron Stewart



Joe Blade is a 'Mean, tough, fighting machine, trained in a Tibetan monastery'. Not only that he is a teenage pin-up and pop idol. He has now forsaken his monkish carrel to rescue six hostages from the evil clutches of Crax Bloodfinger. Armed only with a machine gun he must infiltrate Bloodfingers head-quarters, fight off his private army, blow up the HQ and rescue the hostages in the space of twenty minutes or so.

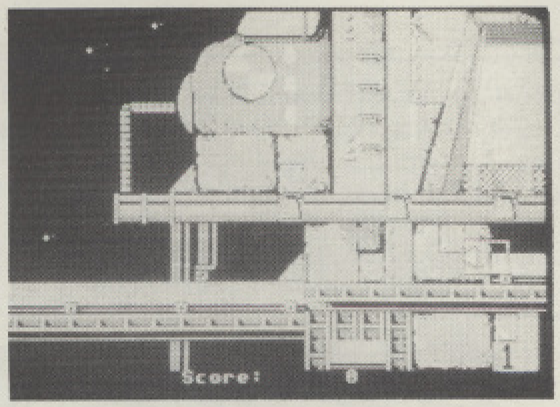
Joe explores the HQ, which consists of cells and passageways. On the way you will have to contend with the soldiers who guard the hostages. This is done with a quick press on the fire button. Having done so the guard will dissolve into little stars, nobody said anything about realism did they? Along uniform, whilst wearing it the guards will ignore you, but even this protection will disappear eventually. Inside the HQ are six booby trapped devices which have to activated to blow up the HQ. Activation is by rearranging a five letter code within thirty seconds. Failing to do so puts an end to the game as the bomb blows up in your face. Once the first bomb is primed you have twenty minutes to find the rest of the hostages and arm the remaining bombs. The game will also end if you are shot enough times. This usually happens when you have run out of ammunition and are rushing around looking for more.

When I first received this game I played it, as I usually do, for a couple of hours to get a feel of it. My initial impression was not very good. I thought the game was slow and boring. Fair graphics, but slow and apt to end abruptly when a booby trap went off. This can be a tad frustrating when you have found three or four of the hostages and have already armed a couple of bombs. I came back and retried the game before I wrote this review and ended up becoming quite hooked. It is not a great game, but for under a tenner what do you expect. There is enough game play here to keep you going for a while.

The original version of this game on the Speccie was a 'No.1 hit' in the budget charts. Frankly, I don't see it as that good a game. Fun, yes, addictive, possibly, but No.1, no! If this is the sort of thing is that Spectrum people rave over, it makes me proud to be an Atari owner!

SPACE ACE
Infogrames
£19.95

Reviewed by John Davison jnr



The latest release from the French company Infogrames is a game which looks suspiciously like a former release of theirs, Prohibition. The game is based around a character by the name of Lee Enfield who is known as a 'Time Troubleshooter'.

Lee is a typical all round good guy who is 'always there when he's needed, ready to lend a helping hand to a close friend or underdog, whatever the call, whatever the time zone'. Space Ace has our brave little pal trying to rescue a friend called Bill from the evil 'Yellow Shadow'. This particular story is set in the twenty second century, and Lee has to shoot the various enemy robots and monsters which pop up all over the place on the suitably futuristic looking scrolling background. You can see the sights of Lee's laser gun and it is you who must control them and destroy the enemy. The gun has some very useful features built in such as a direction indicator showing you in which direction the enemy is and it will also tell you when they are about to fire at you (oh, isn't twenty second century technology a marvel!). After killing all the creatures on one level you must destroy a 'magnetic meteor globe' before running towards the lift and the following level.

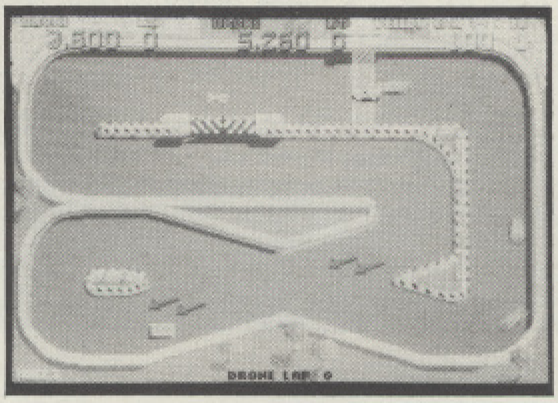
The graphics in the game are, to be quite honest, abysmal. They are badly drawn, chunky looking, and totally bland in appearance. Like its predecessor 'Prohibition' the screens are all drawn in four colours giving each screen a decidedly boring look. The game has also been released on the IBM PC and Amstrad CPC computers and I would imagine that the graphics have been transferred from one of these machines as the ST graphics potential is far beyond what we see here! One good point about the screen is that the scrolling is very smooth and at times very fast.

Another good point in favour of the game is the music over the rather dull looking title screen. The musician who created the excellent tunes for TNT, Charles Callet, again shows us that he can get some very good sounds from the ST sound chip.

Overall, Space Ace did not impress me at all, and although the review copy was a pre-release sample I cannot see that the finished version will be much improved. There are much better games available.

SUPER SPRINT
Electric Dreams Software
£14.95

Reviewed by John Davison jnr



One of the first releases for the ST from Electric Dreams Software is the arcade classic 'Super Sprint'. It is a racing game for one, two, or three players (yes three!) which is viewed from above. During the race there are many obstacles which must be negotiated, including ramps, oil slicks, and opening and closing gates.

The whole package has a feeling of quality. Upon loading the game you are presented with a very crisp and clear loading screen with a scrolling message smoothly moving by at the bottom. Once loaded the game goes through a series of screens including a very well drawn representation of the picture from the packaging and a high score table. You are then moved onto selecting the control methods of the three available cars. These cars can either be computer driven 'drones' or they can be controlled with the joysticks or keyboard. It is the keyboard option that enables you to have a three player game, two players use joysticks and the third uses the keyboard (there is always a fourth computer controlled car). The following screen allows you to select which track you start on and you then move onto the racing!

As well as fighting for the lead position in the race, the four cars must compete to pick up extra points and also 'wrenches'. When four of these wrenches are collected,they can be traded for 'custom parts', including a turbo charger, an increase in speed, and an increase in traction which will enable you to take the corners much more easily. Each of these custom parts can be added to the car in up to five levels, and if you ever manage to obtain all fifteen you can opt for the 'increase score' option.

In all there are eight different tracks which must be raced, some containing underpasses, others containing ramps which must be jumped over. You will come across obstacles on later levels, including oil and water slicks, tornados, cones, and 'poppers', which move up and down to get in your way.

The screen, as mentioned earlier, is the race track viewed from above. The track does not scroll and is similar in layout to the racing games seen in arcades and on home games machines many years ago. The graphics in the game are nothing less than brilliant. The colours are all bright and pleasing to the eye and both backgrounds and the very small sprites are finely detailed. The animation of the cars is incredibly smooth, and they move along the straights and around the bends with great realism. The sound is also pleasing, with some good sound effects during play and pleasant tunes in between the races as the positions and scores are being shown.

Overall, Supersprint is an excellent game and is well worth the price. The impression you get right from the start is one of extreme quality. The graphics and sound are both excellent and it is a VERY playable game. While reviewing it I played it for literally hours on end.

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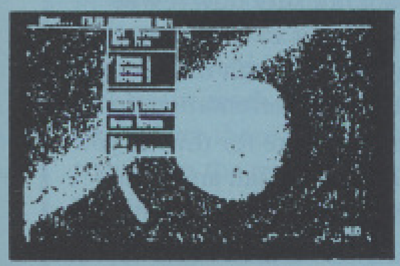
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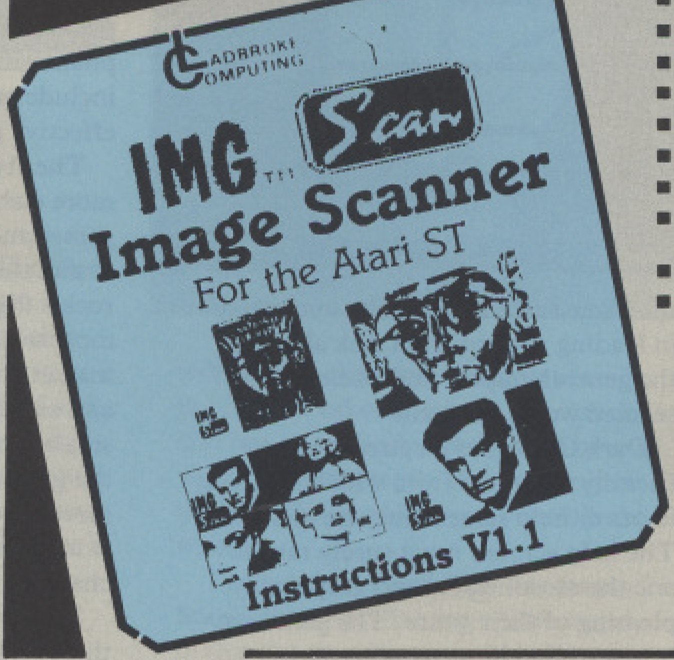
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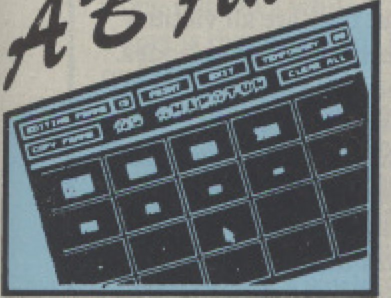
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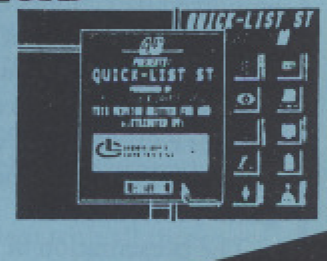


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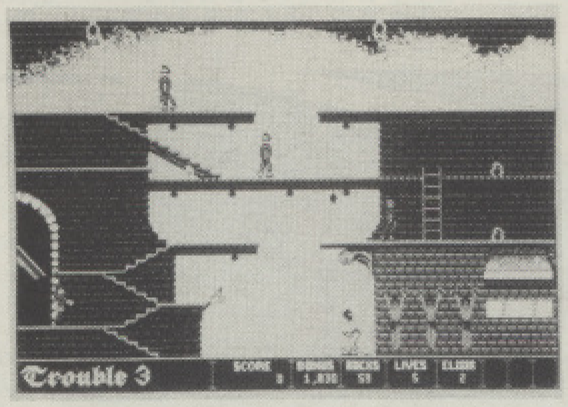
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by A.B. Software for the Atari ST

DARK CASTLE
Mirrorsoft
£24.95



Reviewed by Damon Howarth

The sounds of an organ in the depths of a castle's vaults together with the view of a castle in a storm, worthy of Hammer's best traditions, greets you on loading this magnum opus from Mirrorsoft.

The game comes on three single sided disks with permission to, and instructions on how to, transfer the two data disks onto a variety of alternate storage modes (including even RAM disk). A good idea of the size of data used in this game can be gained from the fact that the RAM disk needs 512K of free memory and a hard disk expects about 800K of space. On the basic STFM I found transferring the information disks onto the external 1 meg drive and then running the whole game from that drive saved me many irritating changes of disk. I did feel that the game suffered from the long delay in loading screens from disk although the general graphic and audio effect seemed worth the wait.

Dark Castle has an attractive user friendly front end from which difficulty levels or help screens may be activated. The help screens must surely rate as one the most helpful and graphically pleasing of their genre. The game can be controlled in many ways and although I found the keyboard and mouse options the most simple and effective way the joystick option looks very workable. Essentially it is a platform and ladder arcade adventure with colour co-ordinated levels and various tasks to perform accompanied by several gruesome sound effects. The character under player control has a pocketful of rocks to throw at the phantasmagoria of opponents which include an evil torturer and a most effective gargoyle.

The style of self defence is somewhat more elaborate than in many such games and necessitates using the mouse to aim the arm and then follow the rock's flight path to a victim. There is a most satisfying metallic clunk when a man at arms is struck on the armour and some lifelike squelching when smaller creatures are hit. The effect of the graphics during the gameplay is more those of a Tom and Jerry cartoon as are some of the spot effects for the character.

I enjoyed this game but am aware that it will be compared to Black Lamp and as such I am not sure how it will bear up. The slowness of screen access can be frustrating, although the game's lighter moments and presentation do a great deal to compensate for this. If you are an arcade adventure fan and want something atmospheric and relaxing then have a good look at this .

LEE ENFIELD
(Amazon Adventure)
Infogrames
£19.95



Reviewed by Damon Howarth

Lee Enfield, it appears, is the official representative of the Time Patrol employed by Colonel Graigh to defeat evil. This is the first of the series that I have come in contact with and since it is actually the third in chronological order it could explain why I had some difficulty in understanding much of the game's relevance.

The presentation of this game from France is of high quality, indeed graphically there is little to fault it on, and the music that introduces the title page is atmospheric and reminiscent of Humphrey Bogart's finest South American adventures. The game, and it's attendant instructions, though leave something to be desired.

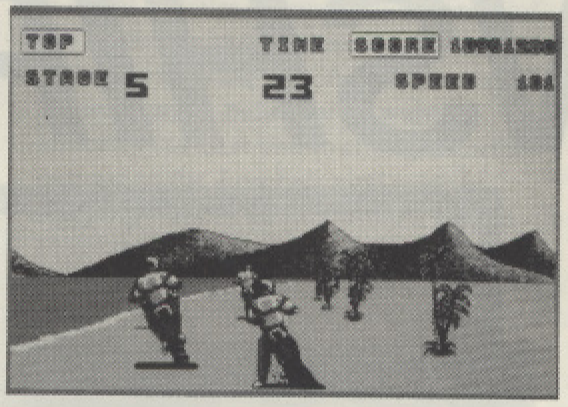
The player is presented with a multi-window display showing a portrait of the redoubtable hero which acts as a form of damage received counter, a playing area which is unfortunately small, and a direction finder to warn of enemies. There are also markers for dynamite used and the current score counter. I admit all of this is in superb soft shaded pictures and the effects of the well sized sprite coming out of the screen is at times surprising but, all in all, it merely disguises a Barbarian style clone wherein the hero wields a mean Bowie knife as opposed to a broadsword.

The controls are either joystick or keys (in fact the keyboard needs to be used at times) and the collision detection seems somewhat haphazard. I could not tell if I was damaging my opponents until they fell over, the same blow seemed to miss or hit without relevance to situation. At least the player does receive a warning of impending doom as his portrait changes to a bloody nosed individual. The screen following his demise is one of Gallic romance as Lee obtains embraces from his nurse and a concerned friend offers him flowers.

The game had a very good graphic back up and somewhat akin to Passengers on the Wind did not have the gameplay to maintain interest, I am still wondering why the range of opponents is so anachronistic? Since there is no real explanation for this all I can assume is that they are all victims of a time warp seen in earlier episodes. Even with this possible explanation in mind I could not see why it was necessary to combat Red Indians and space ships as well as Macedonian Phalnx warriors! Perhaps the one pleasant point was that whenever faced with a cavern without obvious exits Lee could blow holes in the wall with his dynamite. Come to think of it I never did find Bill (the object of the quest) and sadly I did not even feel it mattered – maybe he will be spared having to appear in any further sequels!

ENDURO RACER
Activision
£19.95

Reviewed by Ron Stewart



Pole Position strikes again! This time in the form of motorcycle enduro racing. The blurb on the back of the Activision packing quotes the computer press as saying "The most faithful and compelling coin-op conversion ever seen". This is praise indeed, so I hied off to my local arcade to spend a pound or two. I have to tell you that Enduro Racer can only be described as an average version of the original.

For those of you who have not been to an arcade recently the game is as follows. You ride an enduro motorcycle across a variety of terrains. Lining the side of the track are trees, signs, rocks etc. All are there to ensure that you remain on the track as much as possible. On the road or track itself you will have to avoid other competitors in the form of bikes and vans. The track also has jumps and rocks strewn over it. To jump successfully you have to pull back on the joystick to get your bike to wheelie.

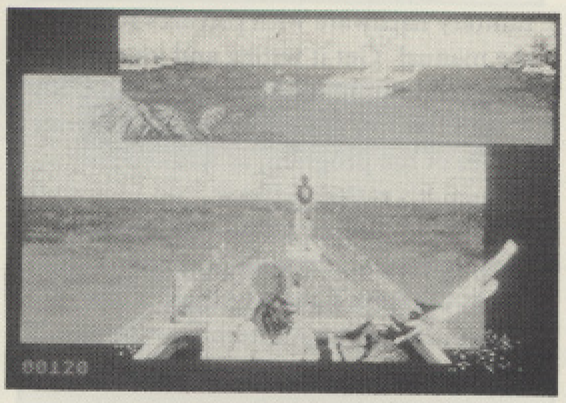
The computer game has five stages. Stages three and five are a little weird in that the road is surrounded by water and in some cases is submerged. Ever seen a motorcycle ski? To be fair to Activision their graphics are great and this is an addictive game. The main problem lies with the collision detection, which is appalling. If you hit another bike you will only be bumped off course. This is little more than an annoyance factor, although you might hit a tree if it happens on a bend. It is also possible to go straight through vans, especially if you have just gone over a jump but what makes this all the more frustrating is that the program is not consistent in its detection. Where you think you will get away with scraping a van occasionally you end up as a heap at the side of the road. I have also found that if you are airborne at the end of the first stage you start the second crashing straight away. Again not consistent, just annoying.

Game control is either by joystick or mouse. I found the mouse to be more accurate when controlling the bike but it was very difficult to throttle with. One nice touch is to the ability to stop the game and save the screen to disk in Degas format.

A pleasant enough way to spend a few hours and fairly addictive, but I am left wondering just how much better it could have been?

CHAMPIONSHIP WATER SKIING
Infogrames
£19.95

Reviewed by Ron Stewart



Infogrames have been fairly prolific in their ST output during the past few months. Recent offerings, Bubble Ghost in particular, have received good reviews in the computer press. With this volume of output it is inevitable that a sub-standard offering comes along once in a while. Championship skiing is that program. In short it's a real Do-Do!

Many unlikely sports have ended up as computer games. Who, for instance, would have thought that darts or shuffleboard could be successfully converted for the computer? But the French having a world Champion in the shape of Patrice Martin, who is nicknamed the 'Sea Prince' have decided to have a go at water skiing.

The program itself is divided into three disciplines, jumping, freestyle, and slalom. These can be selected as separate games or played in sequence. It is possible for up to three people to compete against each other. Select jumping and the screen dissolves into an idyllic tropical island scene. In the centre of the setting is a ski ramp and off to one side is a magnifying glass containing a picture of your skier. He starts to move with a flick of the joystick. This provides the necessary acceleration to get up the ramp. Holding the joystick for too long or too short a time will see the skier ending up splattered over the side of the ramp This takes a deal of trial and error as there is no indication of what is too long or too short. Once you have made it up the ramp you will have to balance the skier to make a perfect landing. Your performance is measured by the distance jumped.

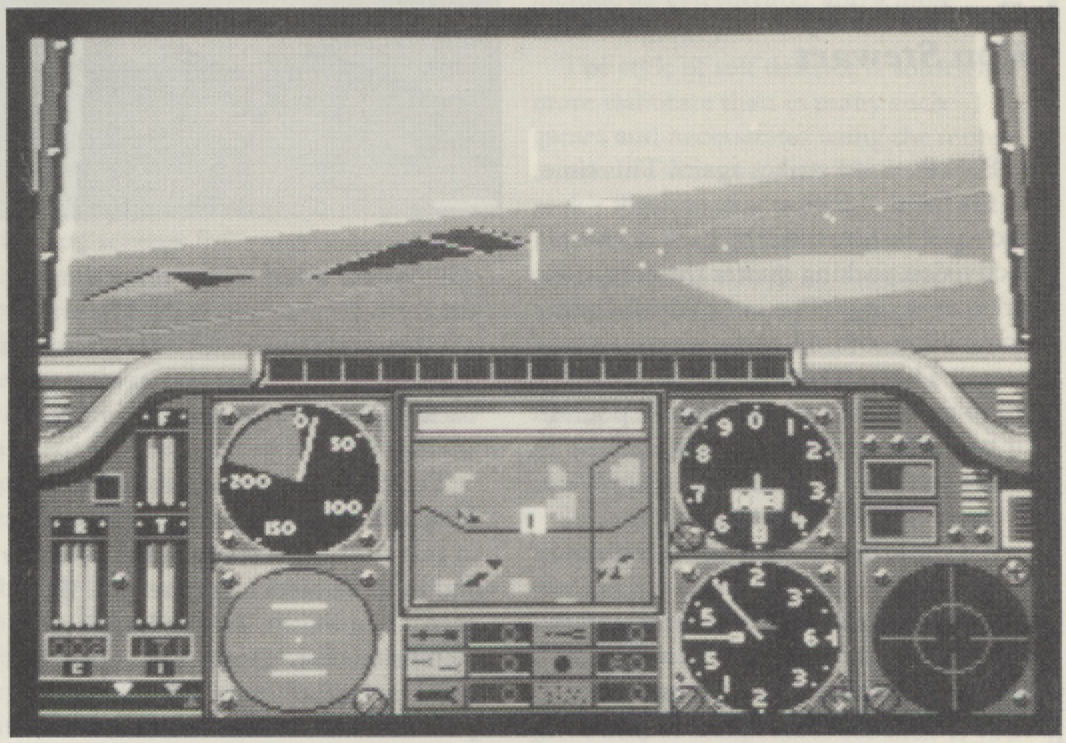
Freestyle shows our trusty skier being towed behind a boat complete with the statutory nubile. To get the skier to perform, the joystick and fire button need to moved and pressed at the same time. Once again this needs a great deal of practice. Just to add insult to injury there are two sets of movements, one when the skier is in the middle of the wake and another when he is on a wave.

The third part of the game involves the slalom course. The course scrolls down a screen which is bordered by yet another nubile young thing this time in a hammock. Control of the skier is either left or right. Moving the joystick up or down shortens or lengthens the rope for extra acceleration around the marker buoys.

The main problem with all three events is the time needed to master the control movements. This applies especially to the freestyle where up to sixteen different actions are possible. I spent a number of frustrating hours just trying to get the hang of it. The background ditty, by the by, is extremely nauseous and soon has to be turned off. Once the control sequences are learnt the is little left in the game to keep you entertained. Maybe water skiing is just one of the subjects not suitable for computers.

Microprose

GUNSHIP



Reviewed by John S Davison

Microprose might easily have met their Waterloo during the development of Gunship, as it took them three times longer and four times the number of people originally estimated. The resultant product has to be something special to enable them to recoup that sort of investment, and from the reception given to the non-Atari versions already released it seems to be exactly that. But what of the ST version? Read on to find the verdict.

The package contains rather more bits and pieces than usual. The strong cardboard box holds two single sided program disks, a full size keyboard template guide for the complex controls, a superb quality 84 page Operations Manual, an ST technical supplement, and a sheet of passwords and countersigns. With the program split across two disks the swapping can become tedious, but two drives may be used if you have them. It can also be installed on a hard disk.

On loading you hear the sound of a helicopter starting up, followed by the sight of a screen-filling, superbly animated picture of the AH-64A Apache attack helicopter rising into view to the strains of Wagner's Ride of the Valkyries. It's a title screen par excellence.

IDENTIFICATION TEST

Your first task is to pass a military equipment identification test by correctly matching a screen picture of a piece of military hardware with pictures found in the manual. Get it wrong and you're assigned to training missions in the USA – a neat way of discouraging use of pirate copies of the program, as without the manual it's rather difficult.

Then you select the overall mission parameters. Operational areas cover the USA, SE Asia, Central America, the Middle East, and Western Europe. Mission types are graded as regular, volunteer, or hazardous. Enemy quality may be set by choosing from third, second or first line troops. Finally, you can choose between easy or realistic mode for flight performance, landings, and weather conditions. Combination of these decides the overall difficulty level of a mission, which in turn affects your chances of survival, gaining promotion, winning medals, and scoring points.

MISSION BRIEFING

With setup complete you're issued with detailed orders at the mission briefing. These tell you to fly to given map references and achieve specific objectives, such as destroying enemy AA guns. A mission consists of a primary and secondary objective, and to complete it you have to achieve both. Success wins you points, and perhaps medals and promotion too. The briefing also includes a weather report; mission timing (anytime day or night); and mission password, which you may be challenged for when approaching a friendly base. Unless you radio the correct countersign in reply you'll be blown out of the sky by your own troops!

A map can be displayed showing the positions of your targets, and you can request an intelligence report to find out what the opposition are likely to throw at you. At this point you can 'report sick' if you don't like the look of the mission. You'll get another mission assigned by your CO, but you'll also earn a

How Easy Is It?

Flying the Apache is relatively easy – it's the combat that's difficult. It's wise to start with the low risk training missions while learning to handle the Apache as you can't be shot down at this stage. Then progress up through the many scenarios to the ultimate challenge – taking on the might of the Warsaw Pact in Western Europe.

To make things easier you can choose 'easy' options rather than the more difficult 'realistic' options. Easy flight mode prevents pitch, roll, altitude, or airspeed affecting lift from the rotors, whereas realistic mode requires you to constantly juggle the cyclic and collective pitch controls to counteract this variation in lift. Easy landing mode means you walk away from all landings, however heavy. Realistic mode here requires you to land correctly or suffer consequential damage to aircraft and ego!

Easy weather conditions ensure light winds, while the alternative causes widely varying windspeeds and temperatures. Low level air turbulence is nicely implemented, but wind induced drift seems somewhat overdone.

In summary, by selecting the right options virtually anyone should be able to fly the Apache. Survival during combat missions is something else however, requiring practice, patience, and skill.

reprimand for malingering, making those promotions harder to achieve.

You then load the Apache with fuel and armaments appropriate for this mission. Weather conditions affect the maximum load that can be carried, so care is needed. Armaments include 30mm chaingun ammunition, Hellfire air-to-ground and Sidewinder air-to-air guided missiles, FFAR unguided rockets, and chaff and flare decoys to confuse the enemy missile systems. Correct selection is important as certain weapons are ineffective against certain types of target.

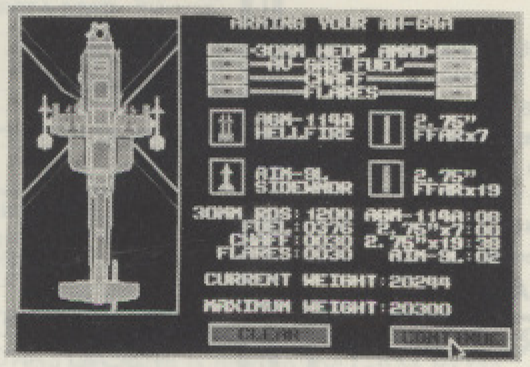
FLYING A MISSION

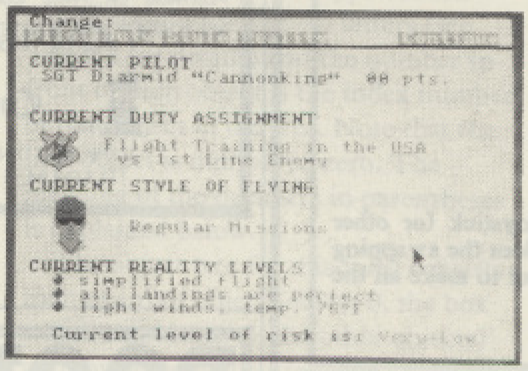
You now find yourself in the Apache's cockpit awaiting takeoff. The screen is divided into two main parts in the usual flight simulator fashion, showing a through-the-windscreen view and the instrument panel. Outside you can see a colour-filled 3D view of the terrain, showing hills, fields, roads, rivers, enemy and friendly bases, and other ground features. No wireframe graphics here! The view can be panned 45 degrees left and right so you're not restricted to looking just straight ahead. The hills are important as they can shield you from detection and attack. As expected, the view changes realistically as you manoeuvre, the horizon smoothly rising, falling, and tilting, and the view scrolling in response to your controls.

Scattered around the landscape are enemy and friendly combat units of various types. They show up only as small dots, and to identify which is which you have to use the Apache's Target Acquisition and Designation System (TADS). This projects a frame onto the windscreen showing a potential target's position. It also puts a TV picture of it on the CRT and locks the selected missile or gun onto it.

At the left of the instrument panel are the engine/rotor speed and torque indicators, and the Apache's inertial navigation system. By placing a cursor on the map display over your destination/target, this system will guide you to it. Next to these are the airspeed indicator and artificial horizon. Centre screen contains a CRT display which can show a moving map of the area, the TADS target picture, or radio messages, while under this the current status of the weapon load is shown.

To the right are the altimeter and vertical speed indicator, and on the far right are the radar/infra-red warning and jamming systems and threat display. This last item shows the position of in-flight missiles, enemy helicopters, and any enemy guns or missile launchers currently tracking you. Across the top of the instrument panel are 14 warning indicators to alert you to enemy inflicted damage to the Apache's vital systems. Keeping track of all this while trying to evade the enemy, find your objectives, and persuade the beast to remain airborne takes some doing!





Control is achieved via the keyboard, with 44 keys dedicated to various functions. The template supplied helps you find your way around these. In addition, pitch and roll may be mouse or joystick controlled. I found the primary controls rather sluggish, but Microprose say this is realistic. I also found the range of movement restricted – you can't roll the aircraft beyond about 30 degrees, nor can you pitch it into a steep climb or dive. Add to this a tail rotor control which only works when you're hovering and you realise Gunship's flight simulation isn't as realistic as it might be.

TOUGH CHALLENGE

Combat is a tough challenge even at the easiest level. I repeatedly found myself nursing one very sick helicopter back to the nearest friendly base after receiving severe maulings by enemy flak and missiles. The flak bursts around you in spectacular fashion, and the missiles can be seen streaking in at you from quite a distance, but it takes skill to avoid them. Despite the Apache's jamming and decoy systems it still takes practice and a cool nerve to be able to deploy the right countermeasure at the right time. Higher levels bring an additional menace – the enemy send their formidable Mi-24 gunship helicopters after YOU!

Your 'Service Record' of achievement is kept in the Pilots Roster. It's already initialised with a set of names, but you can replace these with your own. It's really a sophisticated disk based high-score table.

The general standard of graphics is good throughout, although certain 'incidental' screens look as if they've come straight from a machine of lesser graphics capability. Sound could be better – for instance engine startup noises are pathetic little squeaks instead of the banshee scream of twin turbojets. Rotor sounds are realistic, though.

I found Gunship to be a first class combat simulator, but a little disappointing as a flight simulator. Even so, its depth and complexity should capture your interest and imagination, and its overall quality makes owning it a pleasure. Yes, it **is** something special and deserves to sell well in ST format.

How Does It Compare?

I found Gunship disappointing as a pure flight simulator, as I expected more in-flight agility. Those pitch, roll, and yaw restrictions mar an otherwise excellent simulation. Digital Integration's Tomahawk on the 8-bit machine is virtually identical in concept to Gunship and gives the pilot much more freedom, making spectacular 'torque turns' and other semi-aerobatic manoeuvres possible with practice.

Gunship reminds me of Mirrorsoft's Strike Force Harrier (reviewed in issue 28). This had a similar problem – good combat simulation, but mediocre flight simulation performance. I found Gunship more enjoyable than Harrier, though, as you don't have to perform reconaissance runs to locate the target. I found these got in the way of the action in Harrier.

So, although Gunship is good there's still a need for an accurate helicopter flight simulator on the ST. I'd dearly love to see a helicopter equivalent of Flight Simulator 2. Can you hear me, Sublogic?

GUNSHIP
Microprose
ST only
£24.95

Steve Pedler's
Programming GEM

DIALOG BOXES

Creating those boxes is easier than you might think

In the first three parts of this series we have looked at some of the graphics facilities available from GEM's Virtual Device Interface (VDI). Many of these routines are used by the Application Environment Services (AES) to display menus, dialog boxes (sometimes known as 'forms'), windows and other features of GEM. In this article we shall examine how forms are constructed and how to use them in a program.

OBJECT TREES

The fundamental building block of all forms, (and menus, which are a form constructed to a specific format) is the 'object'. Several different types of object are available, including boxes, text strings, images and editable objects allowing the user to input text. Some of these objects have attributes which can be changed by the programmer, such as colour, but with other types of object this is not possible. A complete form is built up from a series of objects of the required types. In memory, the objects are stored sequentially, but it isn't quite as simple as that because the AES also needs information about how the various objects relate to each other both for display on the screen and for user interaction. This introduces the concept of an object tree.

Object trees can best be explained by use of an example. Most ST users will know the dialog box which is displayed when you select 'Format' from the File menu on the desktop. The object tree for this form is held in the GEM ROM, but it probably looks like the tree shown in Figure 1. The type of each object is shown in capital letters (see Table 2 for details) and the number in front of each object is the index number of that object in the tree. Note that the first object is numbered zero. The meaning of the numbers in parentheses is explained below.

The object tree for this form consists then of a root object (object 0, the box which surrounds all the other objects) and, by analogy to a tree, two levels of branches. The tree can also be thought of as a human family tree. Looking at it this way, the root object has six children (i.e. there are six siblings – the generic term for brothers and sisters). Two of these objects also have two children each. Each object can be said to have a parent object, the only exception being the root object. This may seem a complex way of representing a series of objects, yet it is essential for the construction of even simple dialog boxes. Objects are stored in memory in an arbitrary order, and the tree provides essential information for the AES about how the form is organised.

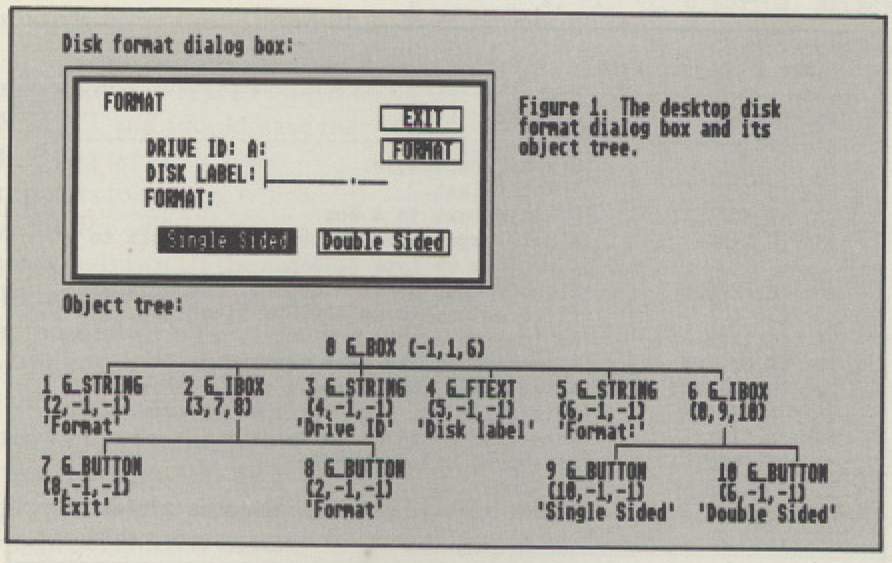


Figure 1. The desktop disk format dialog box and its object tree.

KEEPING TRACK

How does the AES know which objects are parents to which children? This information is contained in the first three 16-bit words of each object's definition, according to the following rules:

Word 0 contains the number of the next higher numbered sibling of the object. All objects may have siblings except for the root object. If the object has no higher numbered sibling, it contains the number of the parent. If it has no parent either (remember this only happens with the root object) this word contains -1.
Word 1 contains the number of the object's first child, or -1 if it has no children.
Word 2 contains the number of the object's last child, or -1 if it has no children.

These three pointers are given in parentheses next to each object in the object tree in Figure 1. You should be able to see that for each object the pointers conform to the above rules.

FLEXIBLE CONSTRUCTION

The use of object trees means that the construction of dialog boxes is extremely flexible. However, the definition of the individual objects must follow a set format. Each object definition consists of 24 bytes, made up of 10 16-bit words and one 32-bit longword. In C, the best way of handling these variables is by means of a structure, and Table 1 shows how the object structure is defined (assuming 16-bit integers, which is not the case with all compilers – for Lattice C, short ints would be used). This code, which

you will probably find in one of the header files accompanying your compiler, defines the structure to be of type OBJECT, so whenever the compiler encounters an OBJECT it treats it as a structure of this type. The use of each field is as follows:

ob_next, ob_first, ob_last: the three pointers to the other objects in the tree, as discussed above.
ob_type: the type of object. The various types available are listed in Table 2. I shall not discuss types G_IMAGE, G_PROGDEF and G_ICON any further here as they are used infrequently in constructing forms (I may return to them in another article). Some of the types of object may appear to be very similar, but there are important differences. With G_BUTTON, G_STRING and G_TITLE, the text is always displayed as black text on a white background, and there is no control over the colour or thickness of the border (if any). G_TEXT and G_BOXTEXT are similar to G_STRING and G_BUTTON, but do allow you to change these attributes, at the cost of some additional programming.
ob_flags: there are nine possible flags which may be set for any object. These are set as individual bit fields within this word, and are listed in Table 3.
ob_state: there are six additional flags which give information about the state of the object to be displayed. These are also set as bit fields and are listed in Table 4.
ob_spec: the object specification. This is a 32-bit longword comprising words 6 and 7 of the object structure.It has different uses depending on the object type:
G_BOX, G_IBOX: word 7 of the object structure is the colour. Bits 0-7 of word 6 contain the thickness of the box border. Bits 8-15 of word 6 are ignored (should be set to zero).
G_BOXCHAR: as for G_BOX, except that bits 8-15 of word 6 contain the ASCII value of the character to be displayed in the box.
G_STRING, G_TITLE, G_BUTTON: ob_spec is a pointer to the text string to be displayed.
G_TEXT, G_BOXTEXT, G_FTEXT, G_FBOXTEXT: with these objects the 24-byte object definition is not sufficient to hold all the required information. The ob_spec field points to another structure (type TEDINFO) which contains the additional data.

The border thickness (only used for boxes) can have the following values:
1 to 127: increasing thickness from the edge of the object inwards.
-1 to -128: increasing thickness from the edge of the object outwards.
0: no border.

If the colour word is applicable to the object type, it is constructed in the following way:
bits 0-3: fill colour (boxes only)
bits 4-6: fill density, where 0 = no fill, 7 = solid fill (boxes only)
bit 7: write mode, where 0 = transparent, 1 = replace (see below)
bits 8-11: text colour
bits 12-15: border colour

Not all these bits have significance in a particular object, exactly which bits are used depends on the object type.

The write mode may need some explanation. As an example, suppose you wish to display some red text on top of an object which is coloured blue. Each character in the character set is constructed on an 8x8 pixel basis (in low and medium resolution). If the write mode is 'replace' – sometimes referred to as opaque – the pixels which are set in the character's definition are displayed in the required colour (red in this case) while the pixels which are not set are displayed in background colour (usually white, unless it has been changed). In this mode then, your text would be displayed as red characters on a white background – not at all what was wanted. In transparent mode, only the pixels which are set in the character definition are displayed, resulting in this case in red text on an uninterrupted blue background.

ob_x, ob_y: the x and y coordinates of the upper left-hand corner of the object. These are absolute screen coordinates only for the root object, for all other objects they are relative offsets from the position of the object's parent.
ob_width, ob_height: the width and height of the object.

Note that these last four fields are often expressed in terms of characters rather than pixels. This is to ensure objects can be used in different resolutions. For example, if an object in medium resolution is 8 pixels high and 24 pixels wide, it would be physically half as high in high resolution because the pixels are half as tall. But if it was said to be 1 character high and 3 characters wide, these sizes could be converted into pixels by multiplying by the character width and height (8x8 pixels in medium resolution, 8x16 in high resolution). The actual physical size of the object would therefore be the same in both screen modes. Objects stored in resource files are always stored in this way, and are automatically converted to pixel sizes

Table 1. Definitions of OBJECT and TEDINFO structures.

```
typedef struct object {
      int ob_next;
      int ob_first;
      int ob_last;
      unsigned int ob_type;
      unsigned int ob_flags;
      unsigned int ob_state;
      long ob_spec;
      int ob_x;
      int ob_y;
      int ob_width;
      int ob_height;
      } OBJECT;
```

```
typedef struct text_edinfo {
      long te_ptext;
      long te_ptmplt;
      long te-pvalid;
      int te_font;
      int te_resvd1;
      int te_color;
      int te_resvd2;
      int te_thickness;
      int te_txtlen;
      int te_tmplen;
      } TEDINFO;
```

Table 2. Object types.

No.	Type	Comment
20	G_BOX	Graphic rectangle.
21	G_TEXT	Graphic text.
22	G_BOXTEXT	Graphic text in a box.
23	G_IMAGE	A bit image. The ob_spec field points to a structure of type BITBLK.
24	G_PROGDEF	A programmer-defined object. The ob_spec field points to an APPLBLK structure.
25	G_IBOX	An invisible box.
26	G_BUTTON	A rectangle with text centred in it.
27	G_BOXCHAR	A rectangle containing a single character.
28	G_STRING	A text string, used for the drop-down menus.
29	G_FTEXT	Formatted graphics text.
30	G_FBOXTEXT	As above, but in a box.
31	G_ICON	An icon.
32	G_TITLE	A text string, used for the menu titles.

and coordinates before display, but if you create objects by hand you will have to perform the conversion yourself if the program is to run in more than one screen resolution.

STORING ADDITIONAL DATA

As mentioned above, some objects need another structure (a TEDINFO structure) to store additional data. The definition of this structure is shown in Table 1. The use of the various fields is as follows:

te_ptext, te_ptmplt, te_pvalid: pointers to three strings. We will return to them shortly.
te_font: there are two possible values; 3 = standard character set will be used, 5 = small character set (as seen in the desktop icons) will be used.
te_resvd1: not used.
te_just: text justification; 0 = left justified, 1 = right justified, 2 = centred.
te_color: colours of text and box (if appropriate). The use of this word is as described above for the object structure, including write mode, fill type and fill colour.
te_resvd2: not used.
te_thickness: box border thickness, as described above.
te_txtlen: maximum length of the string pointed to by te_ptext, including the terminating zero byte.
te_tmplen: maximum length of the string pointed to by te_ptmplt, including the terminating zero byte.

The first three fields all point to strings which can be mixed to form the text which is actually displayed. If the object is being used solely to display graphics text, without it being editable, then te_ptext points to the string to be displayed and the other two fields are ignored. Editable objects are a little more complex, but the rules are straightforward:

1. Objects should be of types F_TEXT or F_BOXTEXT and should have the EDITABLE flag set in ob_flags.
2. te_ptext points to a string which will be displayed in the editable part of the object when it is drawn. If the editable area is to be initially empty, te_ptext must point to a null string (i.e. the first element of the string should be zero). Anything the user types into the editable area will be stored in this string, terminated by a zero byte.
3. te_ptmplt points to a template string. Any underscore characters in this

```
/* AES object demonstration, for Page 6 magazine, England */
/* Version 0.1, 1/1/88 */
/* By Steve Pedler */

/* include files - note these may have different names on your system, e.g.
gemlib.h may be named gemdefs.h */

#include "gemlib.h"

/* defines */

#define WORD short int
#define SURNAME 2
#define FORENAME 3
#define AGE 4
#define MALE 6
#define FEMALE 7
#define AGAIN 9
#define QUIT 10
#define CREDIT 11
#define TITLE 12
#define NOT_STATED -1
#define TRUE 1
#define FALSE 0
#define ROOT 0
#define MAX_DEPTH 20

/* definitions for the object tree */
/* first the strings */
/* templates */
char sur_templt[]="Surname:_________________________";  /* 25 underscores */
char fore_templt[]="Forename(s):_____________________"; /* 21 underscores */
char age_templt[]="Age:___";                             /* 3 underscores */
/* validation strings */
char sur_valid[]="AAAAAAAAAAAAAAAAAAAAAAAAA";             /* 25 letter A */
char fore_valid[]="aaaaaaaaaaaaaaaaaaaaa";                /* 21 letter a */
char age_valid[]="999";
/* other strings */
char credit[]="Page 6 Magazine, England";
char title[]="Sample dialog box";
char again[]="AGAIN";
char quit[]="QUIT";
char male_str[]="Male";
char female_str[]="Female";

/* tedinfo structure initialisation */
TEDINFO tedinf1={ 0L, 0L, 0L, 3, 0, 0, 0x1380, 0, 0, 26, 34 };
TEDINFO tedinf2={ 0L, 0L, 0L, 3, 0, 0, 0x1380, 0, 0, 22, 34 };
TEDINFO tedinf3={ 0L, 0L, 0L, 3, 0, 0, 0x1380, 0, 0, 4, 8 };
TEDINFO tedinf4={ 0L, 0L, 0L, 5, 0, 0, 0x1280, 0, 0, 25, 1 };
TEDINFO tedinf5={ 0L, 0L, 0L, 3, 0, 0, 0x1280, 0, 0, 18, 1 };

/* then the definitions for 13 objects */
OBJECT dial_tree[]={
        -1, 1, 12, G_BOX, NONE, SHADOWED, 0x21193L, 2, 1, 46, 17,
/* object 0 (root object) */
        8, 2, 5, G_BOX, NONE, OUTLINED, 0x21142L, 4, 3, 39, 9,
/* object 1 */
        3, -1, -1, G_FTEXT, EDITABLE, NORMAL, 0L, 1, 1, 33, 1,
/* object 2 */
        4, -1, -1, G_FTEXT, EDITABLE, NORMAL, 0L, 1, 3, 33, 1,
/* object 3 */
        5, -1, -1, G_FTEXT, EDITABLE, NORMAL, 0L, 1, 5, 7, 1,
/* object 4 */
        1, 6, 7, G_IBOX, NONE, NORMAL, 0x1100L, 1, 6, 37, 2,
/* object 5 */
        7, -1, -1, G_BUTTON, SELECTABLE|RBUTTON, SHADOWED, 0L, 8, 1, 8, 1,
/* object 6 */
        5, -1, -1, G_BUTTON, SELECTABLE|RBUTTON, SHADOWED, 0L, 21, 1, 8, 1,
/* object 7 */
        11, 9, 10, G_IBOX, NONE, NORMAL, 0x1100L, 8, 12, 27, 3,
/* object 8 */
        10, -1, -1, G_BUTTON, SELECTABLE|DEFAULT|EXIT, NORMAL, 0L, 5, 1, 8, 1,
/* object 9 */
        8, -1, -1, G_BUTTON, SELECTABLE|EXIT, NORMAL, 0L, 18, 1, 8, 1,
/* object 10 */
        12, -1, -1, G_TEXT, NONE, NORMAL, 0L, 3, 15, 18, 1,
/* object 11 */
        0, -1, -1, G_TEXT, LASTOB, NORMAL, 0L, 14, 1, 17, 1
/* object 12 (last object) */
        };

/* global variables */
WORD gl_charh, gl_charw, work_handle;
char surname[50], forename[50], age[20];

/* program start */
main()
{
        start();
        interact();
        end();
}
/* initialise */
start()
{
        int i;
        WORD dum, work_in[11], work_out[57], desk_handle;
```

```
        appl_init();
        desk_handle=graf_handle(&gl_charw, &gl_charh, &dum, &dum);
        work_handle=desk_handle;
        for(i=0; i<10; i++) work_in[i]=0;
        work_in[10]=2;
        v_opnvwk(work_in, &work_handle, work_out);
        graf_mouse(ARROW, 0x0L);

        /* point the objects requiring TEDINFO structures to the relevant
structure */
        dial_tree[SURNAME].ob_spec=(long)&tedinf1;
        dial_tree[FORENAME].ob_spec=(long)&tedinf2;
        dial_tree[AGE].ob_spec=(long)&tedinf3;
        dial_tree[CREDIT].ob_spec=(long)&tedinf4;
        dial_tree[TITLE].ob_spec=(long)&tedinf5;

        /* initialise the three editable tedinfos to point to our input arrays
*/
        tedinf1.te_ptext=(long)surname;
        tedinf2.te_ptext=(long)forename;
        tedinf3.te_ptext=(long)age;

        /* plug in the other string addresses where needed */
        tedinf1.te_ptmplt=(long)sur_templt;
        tedinf1.te_pvalid=(long)sur_valid;
        tedinf2.te_ptmplt=(long)fore_templt;
        tedinf2.te_pvalid=(long)fore_valid;
        tedinf3.te_ptmplt=(long)age_templt;
        tedinf3.te_pvalid=(long)age_valid;
        tedinf4.te_ptext=(long)credit;
        tedinf5.te_ptext=(long)title;
        dial_tree[MALE].ob_spec=(long)male_str;
        dial_tree[FEMALE].ob_spec=(long)female_str;
        dial_tree[AGAIN].ob_spec=(long)again;
        dial_tree[QUIT].ob_spec=(long)quit;

        /* convert the x/y coordinates of each object into pixels from
        character coords to work in all resolutions */
        for(i=0; i<13; i++) {
                dial_tree[i].ob_x*=gl_charw;
                dial_tree[i].ob_y*=gl_charh;
                dial_tree[i].ob_width*=gl_charw;
                dial_tree[i].ob_height*=gl_charh;
        }
}
/* interact with and maintain the dialog */
interact()
{
        WORD button, cx, cy, cw, ch, bx, by, bw, bh;
        int male;

        form_center(dial_tree, &cx, &cy, &cw, &ch);     /* centre the dialog box
*/
        bx=cx+cw/2;     /* find the points of origin for the grow/shrink box
effect */
        by=cy+ch/2;
        bw=0;
        bh=0;
        form_dial(FMD_START, 0, 0, 0, 0, cx, cy, cw, ch);       /* reserve
screen memory for the box */
        form_dial(FMD_GROW, bx, by, bw, bh, cx, cy, cw, ch);    /* optional grow
box */
        do {
                clear_strings();
                objc_draw(dial_tree, ROOT, MAX_DEPTH, cx, cy, cw, ch);   /*
draw the dialog */
                button=form_do(dial_tree, SURNAME);     /* interact with it
under AES control */
                dial_tree[button].ob_state=NORMAL;      /* reset the exit button
*/
                if(dial_tree[MALE].ob_state & SELECTED) {
                        male=TRUE;
                } else if(dial_tree[FEMALE].ob_state & SELECTED) {
                        male=FALSE;
                } else male=NOT_STATED;
        } while(button==AGAIN);
        form_dial(FMD_SHRINK, bx, by, bw, bh, cx, cy, cw, ch);  /* optional
shrink box */
        form_dial(FMD_FINISH, 0, 0, 0, 0, cx, cy, cw, ch);      /* release the
screen memory */
}
/* clear the input strings so editable fields are empty when box drawn */
clear_strings()
{
        surname[0]='\0';
        forename[0]='\0';
        age[0]='\0';
}
/* clean up and exit */
end()
{
        v_clsvwk(work_handle);
        appl_exit();
}
/* end of program */
```

string will be treated as editable (i.e. changeable by the user) by the AES. All other characters are fixed and not changeable. The template string must contain one underscore per editable character, but any fixed characters are optional. If we look back to the GEM desktop disk format dialog box, the template string for the editable field would consist of the fixed characters 'Disk label:', 8 underscores, a fixed period character, and three more underscores (plus a zero terminating byte).

4. te_pvalid points to a validation string. This tells the AES what sort of characters may be input by the user. There must be one validation character per underscore in the template string, but the different characters may be freely mixed. Table 5 lists the available validation characters.

LET'S CONSTRUCT A DIALOG BOX

At this point we have sufficient information to create quite complex dialog boxes. Listing 1 is a simple demonstration of how this can be done. If you type this in and run it, you will be presented with a dialog box which contains three editable fields, for a surname, forename and age. The user can also indicate his or her sex by clicking on the appropriate button. Finally, clicking on 'Again' redisplays the box with the editable fields cleared, while 'Quit' exits the program.

The program works very simply. The included file 'gemlib.h' contains the necessary macros and structure definitions; it may go under a slightly different name on your system, such as 'gemdefs.h'. Next comes the definitions for the various objects used in the form. Using the information and tables in this article, it should be relatively easy to determine the type of each object and how it will be displayed. All the strings are defined first – note the definition of the template and validation strings required by the three editable objects. The 5 TEDINFO structures are then defined. Whenever a pointer to a string is needed, the field contains a zero byte. These fields will be properly initialised later. Finally there are the definitions for the 13 objects in the tree. These are stored as an array of structures of type OBJECT, so that whenever we need the address of the object tree the array name can be used. Even for one very simple dialog box you can see that a good deal of programming is involved – this is why it is so much easier to use a

resource editor.

The initialisation function start() is very simple, and much of it we have used before. Once the basic initialisation is over, the five objects which require TEDINFO structures are given the address of the appropriate structure in the ob_spec field. Note the cast to a long data type, if this was not present the compiler would generate a warning because ob_spec is declared to be a long in the structure definition. (This is the case in the Lattice C development system used to write this program. If you use another compiler you may find that the structure definitions are slightly different – for example, ob_spec may be declared as a *char.) Then we insert the addresses of the required strings into the OBJECT and TEDINFO structures. Finally the coordinates and sizes of each object are converted from characters into pixels by multiplying by the character width or height. (The sizes of the characters were obtained during the initialisation call to graf_handle().)

THE DIALOG BOX IN USE

Interaction with the dialog is very simple. Function form_center() calculates the coordinates and size of the form when centred on the screen. This is an optional step, but centred forms look nicer. To do this, form_center() is passed the address of the object tree and pointers to four variables which will hold the required coordinates on return. If we want to display an expanding box when the form is drawn, we need to determine the point of origin for the box and its initial size. Here we just use the centre of the screen for the origin and an initial size of zero, but as long as the starting size is smaller than the eventual size you can choose your own origin and sizes.

To display the form, first call function form_dial() to reserve screen memory for the box. The first parameter is zero, (defined as FMD_START in gemlib.h). The next four parameters are not required here, so are set to zero. The last four parameters are the size and position of the form as calculated by form_center(). The next step is optional. This is the expanding box effect, and is done by calling form_dial() again with the first parameter set to 1 (FMD_GROW). The next four parameters are the origin and size of the initial expanding box, the last four being the coordinates and size of the dialog box as it appears on screen.

We then enter a loop which will not be exited until the user clicks on the 'Quit' button. Function clear_strings() simply puts a zero into the first byte of the input strings so that when the form is displayed the editable fields are empty. The form is drawn with the function objc_draw(). This is called with the following parameters:

objc_draw(address of the object tree, first object, depth, x coordinate of first object, y coordinate, width, height)

The x and y coordinates and size have already been calculated by form_center(). The 'first object' is the number of the object to be drawn first. Objects with lower numbers than this will not be drawn. Here the first object is zero – i.e. the root object. The 'depth' indicates to what levels the object tree is drawn. This tree has four levels, but to ensure all levels are drawn I have used the arbitrary figure of 20 (the fact that there are only four levels won't cause an error).

To interact with the form, we call form_do(). The first parameter for this function is the address of the object tree, and the second is the number of the first field to be edited – in this case the surname field, though it could just as well be any of the three editable objects. This is so that the AES knows in which field to put the cursor. If there are no editable objects, this parameter must be zero. Form_do() will not return until the user selects an object which has the EXIT or TOUCHEXIT flag set. Then it will return the number of the exit object selected.

Table 3. Object flags.

Value	Name	Result if flag set
0	NONE	No flags set.
1	SELECTABLE	The object can be selected by the user with the mouse. It is then drawn in reverse.
2	DEFAULT	If the object is selectable, it can be selected with the Return key. There can only be 1 default object per tree.
4	EXIT	Ends the interaction with the AES and control is returned to the program.
8	EDITABLE	The object can be edited by the user.
16	RBUTTON	The object is a 'radio button'. Within a group of radio buttons, only one can be selected at any time. When another button in the same group is selected, the previously selected button is deselected.
32	LASTOB	The object is the last one in the tree. Only one object per tree can have this flag set.
64	TOUCHEXIT	As for the EXIT flag. However, if this flag is set the user need only press the mouse button, rather than press and release as required for the EXIT flag.
128	HIDETREE	The object and all its children will not be drawn if this flag is set.
256	INDIRECT	The ob_spec field of the object definition acts as a pointer to the required value, rather than containing the value itself. This makes it much easier to alter the object specification, since the contents of the ob_spec field are not changed directly.

TIDYING UP

Before we can finish with the form there is some housekeeping to do. The exit object is now in a selected state, and must be reset to unselected. If this is not done, it will be displayed as selected when the form is drawn again. This is achieved by the statement 'dial_tree[button].ob_state = NORMAL', which clears the SELECTED flag on the button used to exit the form. Try leaving this out and see what happens. Anything that the user typed into the editable fields is now stored in the arrays surname[], forename[] and age[]. It isn't shown here, but in a real application you could now manipulate these strings in some meaningful way, such as saving them to disk.

How do we know if the user clicked on the 'Male' or 'Female' buttons? (They can't both be selected because they are radio buttons.) Whichever one

was chosen will have the SELECTED bit set in ob_state, so we test the ob_state field of each button by doing a bitwise AND. The variable 'male' is set to either TRUE or FALSE depending on the result, or to NOT_STATED if neither button was selected. This time we don't reset the object to its unselected state, leaving it pre-selected (as a possible default option?) when the form is next drawn.

When the interaction is complete, we perform the (optional) step of drawing a shrinking box, by calling form_dial() with the first parameter set to FMD_SHRINK. Screen memory is released with the final call to form_dial() with the parameter FMD_FINISH.

NOT THAT DIFFICULT!

As you can see, the construction and use of dialog boxes is not difficult, and is made even simpler by the use of a resource construction set. In the next article we will briefly look at the use of resource files and then go on to examine the programming of the drop-down menus.

Table 4. Object states.

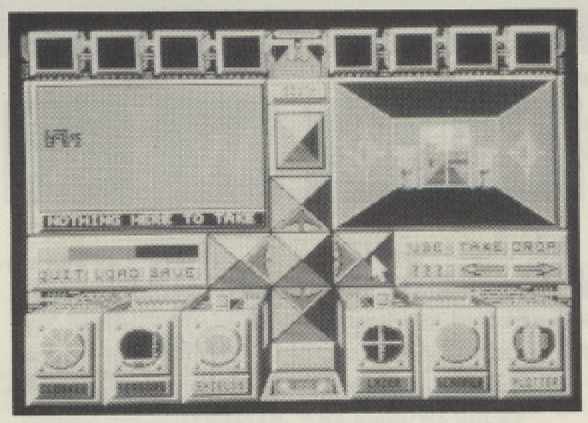
Value	Name	Result if bit set
0	NORMAL	None - default object state.
1	SELECTED	The object has been selected and is drawn in reverse.
2	CROSSED	An X is drawn across the object (boxes only).
4	CHECKED	A tick mark is drawn in the object (used for drop down menus).
8	DISABLED	The object is drawn with faint lines and text. An object so drawn cannot be selected by the user.
16	OUTLINED	An outline is drawn around the object (boxes only).
32	SHADOWED	A shadow is drawn around the object on the lower and right-hand sides (boxes only).

Table 5. Validation characters for editable objects.

Character	Input characters allowed by the AES
A	Letters A-Z (upper case only), spaces.
a	Letters A-Z (upper and lower case), spaces.
N	Letters A-Z (upper case only), digits 0-9, spaces.
n	Letters A-Z (upper and lower case), digits 0-9, spaces.
F	Valid filename characters plus '?', '*', ':'.
P	Valid filename characters plus '?', '*', ':', '\'. This differs from validation character 'F' in that 'F' should only allow input of a filename plus a drive specifier whereas 'P' also allows subdirectories to be specified. In practice a slight bug in GEMDOS seems to mean that the '\' separator is needed even if no folders are used (e.g. A:\MYPROG.C), so it would seem sensible not to use the 'F' character.
p	Valid filename characters plus '\' and ':'. This means that the user can input any single filename, including drive and subdirectory specifiers, but cannot use wildcards.
X	Any character can be input.

SLAYGON
Microdeal
£19.95

Reviewed by John Davison jnr



Slaygon is one of the latest releases from Microdeal who seem to have been very quiet with their ST releases of late. This game is a graphical, mouse controlled adventure which has you playing the part of a United Defence Force military officer. Your job is to take the controls of the Slaygon and infiltrate the Cybordynamics laboratory. Slaygon is described as the ultimate infiltration device. It is the most sophisticated military robot ever created, and it is so powerful that conventional weapons have no effect on it whatsoever.

Your mission is to destroy the laboratory facility and therefore destroy the strain of toxic virus which Cybordynamics are working on. You have managed to obtain a forged low security pass which will give you limited access to the laboratory complex. You must manoeuvre around the five hundred rooms avoiding four different types of security robot and various different forms of mine and force shield which block your path. The rooms within the complex all have security checks on the door and you must have the correct colour card or a high level card in order to enter a room. In all there are five security levels.

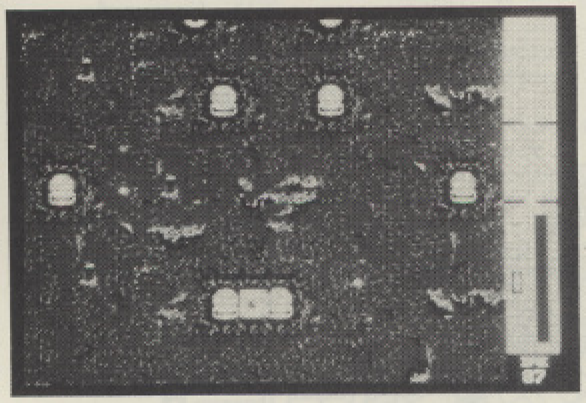
Slaygon has various useful facilities to help you, including energy absorbing shields and a cloaking device. These devices do drain energy however, and without energy you cannot continue on your quest. On your travels you will find over thirty six objects which can be picked up and used, and these range from security passes to force field or mine deactivators. Slaygon has storage facilities for eight objects, but each object carried drains some energy.

The screen layout shows the objects carried at the top of the screen with the three dimensional outside view below on the right and the map screen below on the left. In the centre of the screen are the direction pointers which must be clicked on with the mouse to move the Slaygon around the laboratory complex. Near these pointers are the Quit, Load and Save game switches, and your Energy indicator. To the right of the pointers are buttons for using the various objects you are carrying and for examining objects. At the bottom of the screen are the switches for activating the cloaking device, shields, scanners, weapons, etc.

Slaygon's graphics are very clear. They are not superb, but then this type of game does not really call for mind blowing graphics. Sound also is not that good, but that again doesn't really matter. The game is very playable and I have spent many hours playing it. This review has really only scratched the surface of an excellent game and if you like graphical adventures then you will probably like Slaygon.

TRAUMA
Ere Informatique/Metal Hurlant
Distributed by Infogrames
£19.95

Reviewed by John Davison jnr



The latest game from the people who brought us 'Bubble Ghost' is a vertically scrolling shoot 'em up, boasting 'digital music'. The game comes in a double cassette sized box and is spread across two disks, but the first disk appears to contain nothing but the loading screen and the sampled music.

The game has the typical space shoot 'em up type scenario complete with 'barbarian war fiends' who are apparently about to pulverize the solar system. Your mission (surprise, surprise) is to stop the catastrophe from happening. You must destroy the enemy planet which is, of course, defended by various forms of attack ship, and giant 'hyper ships' which are supposed to be indestructible. Along the way you can pick up new weapons systems for your craft, and each time you succeed in destroying the supposedly indestructible hyper ships you will collect an energy generating globe. There are four globes which go together to give energy to the 'space barbarians' and each globe is guarded by a hyper ship.

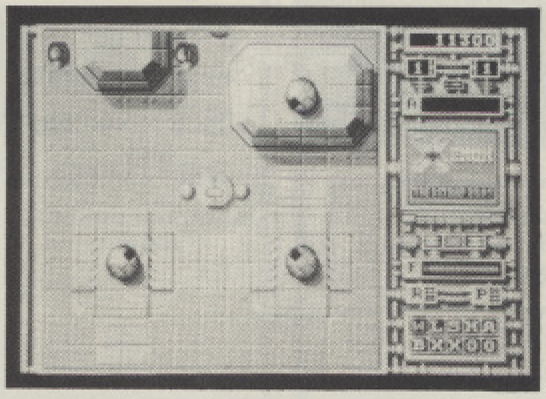
The 'digital music' of which the packaging boasts is some of the silliest I have ever heard. The sampling quality is superb, but what has actually been digitized is awful! Every now and then the jolly, bouncy little tune is interrupted by a deep voice muttering "T-T-T-T-Trauma" in an obviously French accent. The effect could be good given the correct style of music, but the way it has been done at the moment is just a joke! The sound effects during the game are not sampled and are, to be honest, a little feeble. They are, however, adequate for the game which rarely has silent moments during play.

The graphics in the game whilst not being superb are more than acceptable and are pleasing to the eye, being colourful, well drawn, and fairly detailed. The animation of the sprites is reasonable and the relatively large 'hyper ships' are quite well drawn and animated, but in some cases they look a little 'transparent' as parts of them seem to fade away into the background.

Overall 'Trauma' is a good shoot 'em up. It does not excel in any areas nor does it break any new ground in ideas. However, it is very playable and has (for once in this type of game) just the right level of difficulty, being neither excessively hard nor easy to play.

XENON
Melbourne House
£19.95

Reviewed by Damon Howarth



I am now the proud owner of a melted joystick! Xenon, Melbourne House's new vertical scrolling shoot 'em up, is the cause of the disaster. Furthermore it has created bags under my eyes and given me arcade players cramp. It would in fact be fair to say I have become somewhat hooked on this particular excursion into space, much to the dismay of the household in general.

The game play is fast and furious, the effects loud and bright and the all round feel of the game is a very close approximation to the exhilaration felt in an arcade. The packaging consists of the almost compulsory story explaining that you must foray through Xenite territory in an effort to reach your superiors and, in the same booklet, an explanation of the controls and the myriad opponents that need destroying. Oh yes! there is also the disk, which leads me to wonder why such large boxes contain such small contents?

The game is controlled via the joystick and optional (although I found preferable) spacebar presses, in a most responsive and positive manner. One thing that differentiates this from the run of the mill upward scrolling style of game is the tactical thought that is necessary to survive. In the main the choice as to vehicle type has to be made on a regular split second basis and can mean the difference between existence and nothingness. The ground car is used against low level opponents and is capable of obtaining certain advantages whereas the flying fighter is the only resource for air warfare and the recovery of other speciality rewards.

The beginning of each stage or level is preceded by a digitised speaking photograph of Captain Xod urging you to victory and informing you as to the current sector number. Graphically the game is superb and the soundtrack which accompanies the game compliments the general feel of excellent presentation and the aura of professionalism which surrounds the whole experience.

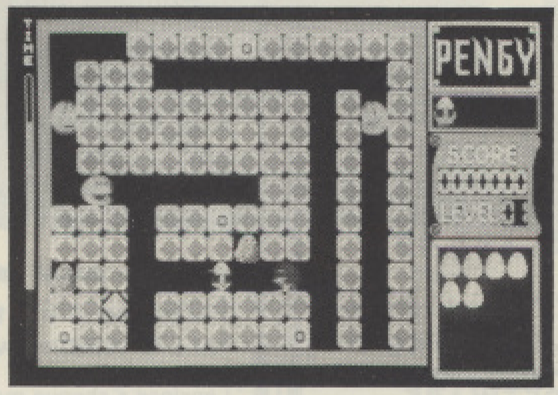
Once launched there are a variety of wondrous aliens to destroy ranging from the simple unarmed drone which explodes upon contact to the forward shooting ladybirds and the extremely tough and intelligent Sentinel aliens who take many hits to dent and whose one touch sends your ship into oblivion. One of the most complicated parts of the game seems to be remembering the various bonus letters and subsequently making the choice as to which of mutually contradictory bonuses to take while in motion. This, to my mind only adds to the tactical feel of the game since the choices must affect your battleplan.

For those who enjoy an even more competitive style of mayhem there is a two player option which allows the players alternate attempts with the same joystick and this also plays very well. The box claims the game has self adjusting difficulty which in my experience would seem to indicate that the game starts fast and deadly and progresses to mercurial and fatal, there just did not seem to be a turtle like and safe option aside from the automatic demo mode!

All in all this seems a very worthwhile buy and would seem a must for any arcade or general gamester. The whole package exudes value and I have no hesitation in recommending it to anyone.

PENGY
Red Rat Software
£9.99

Reviewed by John Davison jnr



Pengy is one of Red Rat's first games for the ST. As you can probably guess from the name, it is based on the old favourite, Pengo, which has come out in many different guises on home computers since it was released in the arcades all those years ago.

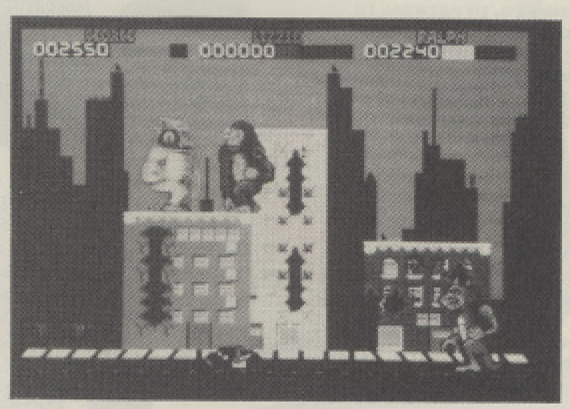
In this version you play the part of Eddy the Penguin who lives in a castle constructed of blocks of ice. Life would be perfect if it weren't for the Snow Ghouls and Ghosts which haunt the castle. Eddy has the ability to slide the ice blocks which make up the rooms, the idea being to use them to squash the nasties which are chasing after him. As well as squashing the ghouls to obtain a greater score, Eddy can also activate the electrified walls which surround each screen. This freezes any nasties walking next to them and allows Eddy to walk over each ghoul caught in this way and then receive a score for killing them.

Graphically, Pengy is pleasant but looks rather old in style. The background and the sprites are fairly flat and simple, although quite colourful. Animation is very smooth and Eddy is decidedly cute in appearance. Sound effects in Pengy are minimal and are not exactly awe inspiring.

Although the game is quite pleasant I do think that Red Rat could have tried a bit harder. The graphics could be improved immensely and the sound could be made considerably better. A bit of music on the title page might be nice as well. All of these improvements could have been and should have been made, as the entire game is a tiny 46k! My personal view is that if you were to spend the asking price of around ten pounds for this game, you might be disappointed, however there are worse games around for a similar price and I do know of people who quite like Pengy!

RAMPAGE
Activision
£14.99

Reviewed by John Davison jnr



Yet another arcade conversion for the ST, this time in the shape of Rampage from Activision. The packaging boasts that you can "See proud cities reduced to rubble! Witness acts of primeaval savagery! Gasp at male and female nudity!"

The story behind this game of mass destruction begins in the Greaseburger fast food emporium where three unlucky customers got more than they bargained for in their 'Big Mucks'. The company's research division had apparently shipped some experimental food additives by accident. The effect of the burgers on our three heroes George, Lizzie, and Ralph was that, apart from nausea, indigestion and a foul aftertaste, they had the sudden desire to rip off all their clothes and adopt the attire of designer fur and scales, and grow to around fifty feet tall! George, Lizzie and Ralph have become a Gorilla, a Lizard, and a Wolfman – and boy are they mad!

The aim of the game, which can be played by three players (two with joysticks, one with the keyboard) is to survive, by finding things to eat behind the walls of skyscrapers. Things which our three friends find pleasant to eat range from the occasional goldfish in its bowl to a rather tasty human. To reach these edible items each 'monster' must smash away at the walls and windows with his/her fists. Some things which they do not find pleasing to eat are toasters, TV sets, and potted cacti! If one of these items is grabbed, then some damage will be inflicted on the creatures concerned. Damaged buildings will eventually collapse into rubble, and if one of the creatures is still clinging to the side when it falls, again some damage will be done to him.

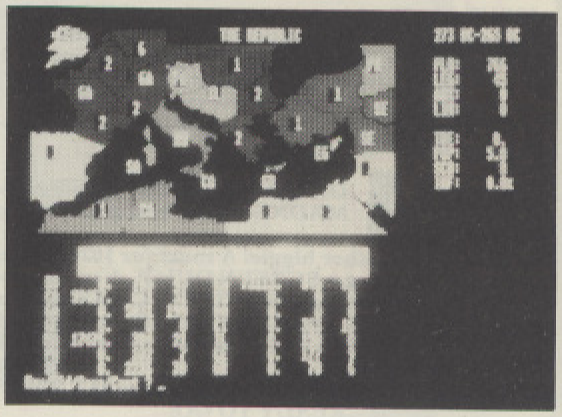
The nation's military is also desperately trying to destroy the monsters by sending in tanks and attack helicopters. If a character loses all of his/her energy then he/she reverts back to human form, and has to shuffle off the screen naked! Aha! So that's where the male and female nudity comes in.

The game's graphics and sound are both superb. The backgrounds are very well drawn and are very colourful. The large sprites are also extremely well drawn, and have smooth animation. The background music by David Whittaker is first-rate and the sound effects of the buildings being smashed to pieces are really convincing. The game is highly playable with three players, but after playing for a long while you may begin to tire of it. Rampage is extremely violent, but great fun and I can highly recommend it.

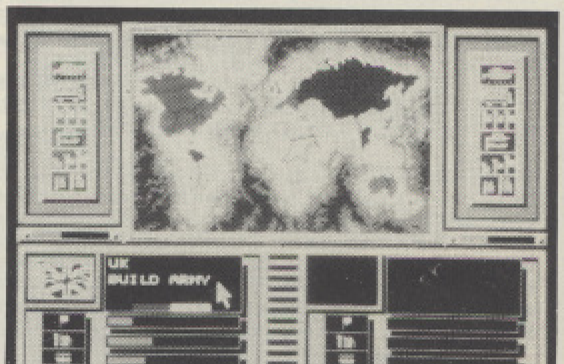
MORE ST SOFTWARE ...

Among the others received for review recently are the following. For the most part they arrived too late to get out to our reviewers in time for this issue. Watch the next issues for the appropriate reviews.

ANNALS OF ROME from **PSS**. One of the first home produced war game simulations set in ancient times. £24.95. **UNIVERSAL MILITARY SIMULATOR** from **Rainbird**, another war simulation in which you can fight any battle you can imagine whether real or not. Pitch Hannibal against Hitler! Loaned to us by Software Express, we are still awaiting a review copy from Rainbird. **POWERPLAY** from **Arcana**, a company new to the ST brings you a unique quiz game in which you take the part of ancient gods in a tussle for knowledge. **POWER STRUGGLE Ffrom BPSS**, second ST release from this British war gaming company which will be reviewed next issue. **OIDS** from **Mirrorsoft**, an incredibly detailed and addictive shoot 'em up in Defender style but with much, much more. **SKYFOX** from **Electronic Arts**, the well known flight/combat simulator makes it to the ST at last. BJUMP JET from **Anco**, another flight/combat simulator which has some stiff competition. **GFA BASIC: ADVANCED PROGRAMMING** from **Glentop**, a book and disk which will give GFA users a lot of information to stretch this excellent Basic to it's limits. The book is available at £15.95, the disk is £8.50 but you can have them both for £19.50. **MUSIC CONSTRUCTION SET** from **Electronic Arts**, now you can make music on your ST with one of the most famous and top quality music programs from the 8-bit world. **ULTIMA IV QUEST OF THE AVATAR** from **Origin Systems** now released on the ST, see John Sweeneys four page review in Issue 23. **HIGH JACK** from **Vogler Software**, a desk accessory with a superb scientific calculator that combines several most used desk accessories into one. **POWER BASIC** from Hisoft, received literally a couple of days before this was typed, looks an excellent Basic at £39.95.



The first two British ST wargames from PSS



PAGE 6 back issues represent an excellent way of increasing the enjoyment of your Atari with articles to enlighten you, programs to type in and reviews of software to guide you. Almost all of the content of past issues will be as fresh and relevant today as when it appeared – increase your enjoyment now, before it's too late! Disks are available for all issues, containing all the 8-bit programs from each issue ready to run, and they often include bonuses not found in the magazine.

BACK ISSUES

ISSUE 20 – GRAPHICS SPECIAL. A super special issue with a graphics theme. Draw some masterpieces with GRAPHICS WORKSHOP and explore your graphics potential with Colour Palette, Picloada, Colour Attributes and CIO Slideshow. An in-depth review of Printshop and Graphics Art Department, the final part of Display Lists and the Adventure column. 11 pages devoted to the ST plus a colour feature ATARI ART and ST GALLERY. And there's more! BLOCKBREAKER is one of the best games to have been published in any magazine. Don't miss it!

BONUS DISK AVAILABLE – includes BONUS PICTURES for Graphics Workshop

ISSUE 21 – A packed issue with games, TRAIN CRAZY, REVENGER and FORKLIFT. Utilities SCALEMASTER, QUICK DISASSEMBLER and Measuring Temperature. Programming hints with Doing The Impossible, Error 8 Solved and THE GUIDE TO ERROR CODES. Reviews of Flight Simulator II, Hitchhiker's Guide to the Galaxy, and the latest Adventures. For the ST a DEGAS to NEO converter, Lattice C reviewed and reviews of a whole host of software.

DISK AVAILABLE. All programs ready to go.

ISSUE 22 – More serious users will enjoy SMARTSHEET, a Visicalc like type-in spreadsheet, plus our review of Paperclip whilst gamesters will puzzle over TRICKY CUBES and try to survive HIDDEN DEPTHS. The Guide to Error Codes is concluded and there are articles on Fractals, Tape Problems and some less well known Adventures. Loads of reviews and some great new routines for Blockbreaker. ST users will find out how to program Sprites and can read reviews of Time Bandit, Pro-Fortran 77, VIP Professional and more.

BONUS DISK AVAILABLE – DOUBLE SIDED! Contains TWO versions of TRICKY CUBES and new versions of BLOCKBREAKER.

ISSUE 23 – Another superb machine language game WATER SKI SCHOOL will test your reflexes. WORDSEARCH will challenge those who like puzzles and other listings include SUPERCLOWN and the utilities XREF and VERIFY. A huge review of Ultima IV heads a comprehensive review section and Going Online Part 1 will let you know if telecommunications is for you. ST owners can discover how to get a bigger screen on their colour monitor and read reviews of Zoomracks, Sierra On-Line adventures and Pro-Pascal amongst others. Also, is it worth adding a 5¼" drive to your ST?

BONUS DISK AVAILABLE. Contains TWO BONUS PROGRAMS!

ISSUE 24 – The biggest issue so far published! Great ST section with info about ST disks and cartridges and loads of reviews. For 8-bit users there is MUNCHY MADNESS, the best game we have ever published plus a super cheque book utility AUTOCHECK. Plus all about checking your disk drive, another game called FLYING HIGH, more utilities, reviews of RAMBIT, Adventure games and lots more. Too much in this issue to list fully!

DISK AVAILABLE – Don't miss MUNCHY MADNESS, the best game we have published so far!

ISSUE 25 – Another biggie! A must for 1029 printer owners with 3 great utilities including a SCREEN DUMP. A super Japanese chess game called SHOGI, a type in REVISION C BASIC, a full feature on disks and more. For ST, type in OTHELLO, reviews of LEADER BOARD and MEAN 18, Hints and Tips and several other reviews and articles.

DISK AVAILABLE – ALL THOSE 1029 PROGRAMS READY TO GO!

ISSUE 26 – SOLID MODELLING is one of the best non-game programs we have published. Be creative! Other programs include SOURCE WRITER for machine code programmers, FLEXIBLE FINGERS to help you type, NUTS and more. Reviews of TRIVIAL PURSUIT, DVC/65, SPEEDSCRIPT and much, much more. ST users can learn all about HARD DISKS, FAST BASIC, TYPESETTER ELITE, DEGAS ELITE and read reviews on a whole lot more software.

BONUS DISK AVAILABLE – DOUBLE SIDED! TWO virtually full sides with BONUS SCREENS for SOLID MODELLING!

ISSUE 27 – Some cracking listings for the 8-bit. In GREAT BRITAIN LTD. you can be the Chancellor and help run the country. COMPUTER GAMMON is a great Atari version of backgammon and there's ANTS IN YOUR PANTS, DISK COMMAND and others. There is a feature on word processing and stacks of reviews. The ST section includes an in-depth review of ART DIRECTOR and a neat little program to put scrolling stars on your screen! Lots of reviews including HABAVIEW, K-SPREAD 2, K-WORD and many more.

DISK AVAILABLE – some L-O-N-G LISTINGS!

ISSUE 28 – Extend the incredible original Munchy Madness with the MUNCHY MADNESS SCREEN DESIGNER, play GREEDY CATERPILLARS with a friend, teach your children with MOST HEART MATHS or make up some crosswords with XWORD. A long feature on flight simulation programs, hints on ZORK and loads of reviews. For ST users, the first in a series of USING GEM from C plus FLIGHT SIMULATOR II reviews, new books from COMPUTE! and a whole stack of reviews.

DISK AVAILABLE – Also contains the winning title screen from our competition.

ISSUE 29 – One that serious 8-bit users have been waiting a long time for – a great full feature database – MJDBASE plus an amazing story maker, STORYBOOK, that allows you to create illustrated stories. Then there's a great game from ANTIC called CLIFFHANGER and an AUTORUN maker and more. Cheat on commercial games with ZAPPING THE RIGHT BYTE and read stacks of reviews. The ST section has a type-in program, SCREEN GRABBER, which allows you to 'snatch' pictures of commercial games to disk, plus the next part in our GEM FROM C series and reviews of Superbase Personal, K-COMM 2 plus lots of games including Barbarian. Another big issue.

BONUS DISK AVAILABLE. DOUBLE SIDED. With BONUS story for STORYBOOK and STORYBOOK reader.

ISSUE 30 – A great follow up to Solid Modelling allows you to animate 3-D objects. Try 3-D ANIMATOR. How about a puzzle with LETTER CASTLE or an arcade style shoot-up from ANTIC called DESERT CHASE? Articles include an in-depth look at GUNSLINGER, Genealogy With Your Atari and First Steps on saving screens. Loads of reviews including AUTODUEL and P:R: CONNECTION. The ST section includes the continuing GEM series, CYBERSTUDIO, ZOOMRACKS II and loads of games and serious reviews including GFA BASIC, K-Roget, Jupiter Probe and more.

BONUS DISK AVAILABLE. DOUBLE SIDED with BONUS MACHINE LANGUAGE ADVENTURE only available on this disk!

ISSUE 31 – Our massive survey on all the WARGAMES available for the 8-bit Atari heads this issue which also includes a great type-in synthesiser listing called ORIGINAL SYNTH. Other listings include FONT FACTORY, a nice character editor and a challenging game called BOWL TRAP. A feature on SSI, more Tutorial Subroutines, a long feature on THE NEVERENDING STORY, reviews of ROADWAR 2000 and THE DUNGEON plus many more are also in this issue. ST SECRETS, a new series on ST programming begins with a look at sound and the ST reviews section includes IMG SCAN, BASE TWO, TEMPUS and many more.

DISK AVAILABLE – All the extra files for ORIGINAL SYNTH set up ready to run plus all the other listings.

ISSUE 32 – A great card game for 8-bit users called, rather uninspiringly, WHIST plus a two player game of TENNIS and a GRAPH MAKER that works on the 1029 printer. A new series starts on EXPANDING YOUR ATARI and there is an excellent program/tutorial on BUBBLE SORTING. Reviews include THE PAWN, GUILD OF THIEVES, SPARTADOS/U.S. DOUBLER and many more. ST users can find out about programming graphics with ST SECRETS and can read all about the TURBO DIZER, PC DITTO plus reviews of Tanglewood, Defender of The Crown, Winter Olympiad, PROSPERO FORTRAN and more.

BONUS DISK AVAILABLE – DOUBLE SIDED with BONUS MACHINE CODE ARCADE GAME available only on this disk.

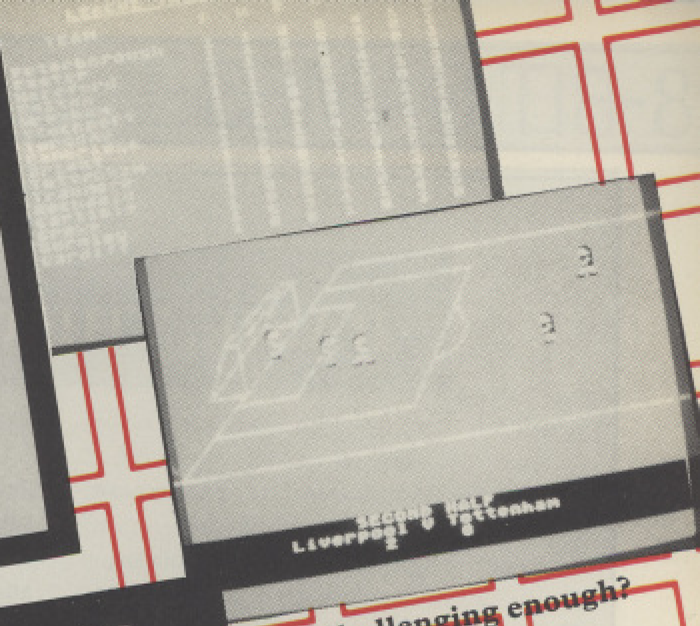
All back issues are £1.20 each in the U.K., £1.95 for Europe or surface mail elsewhere and £2.75 for Air Mail outside Europe.

PAGE 6 Issue disks will run on any 8-bit Atari with 48k or 64k memory. Each disk is just £3.95. Postage is FREE in U.K. Overseas please add £1 per order (for any number of disks).

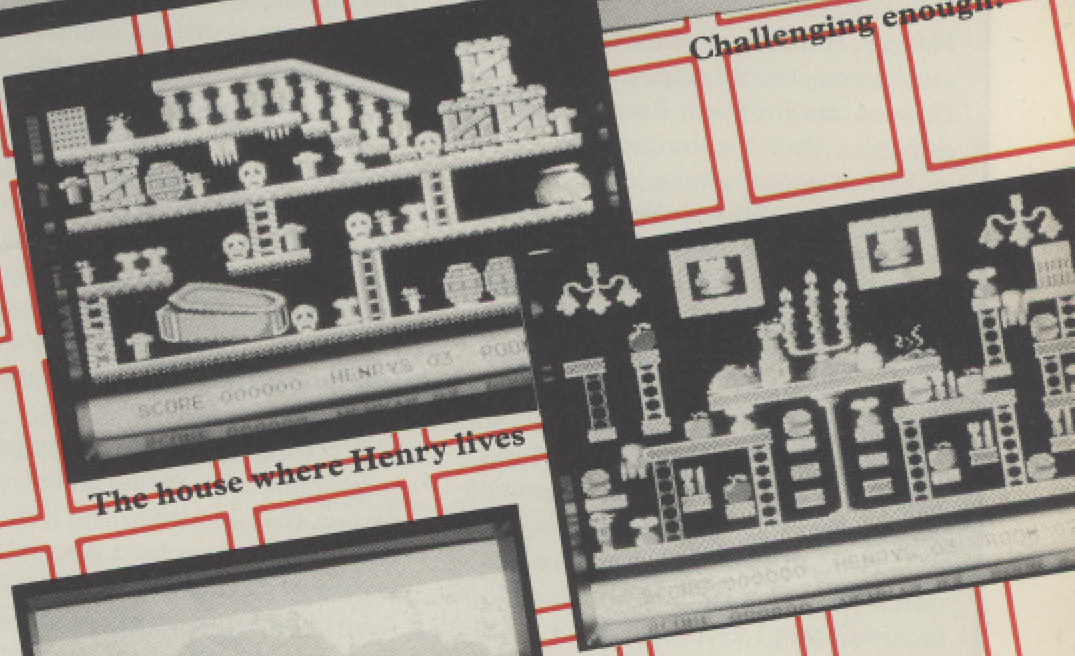
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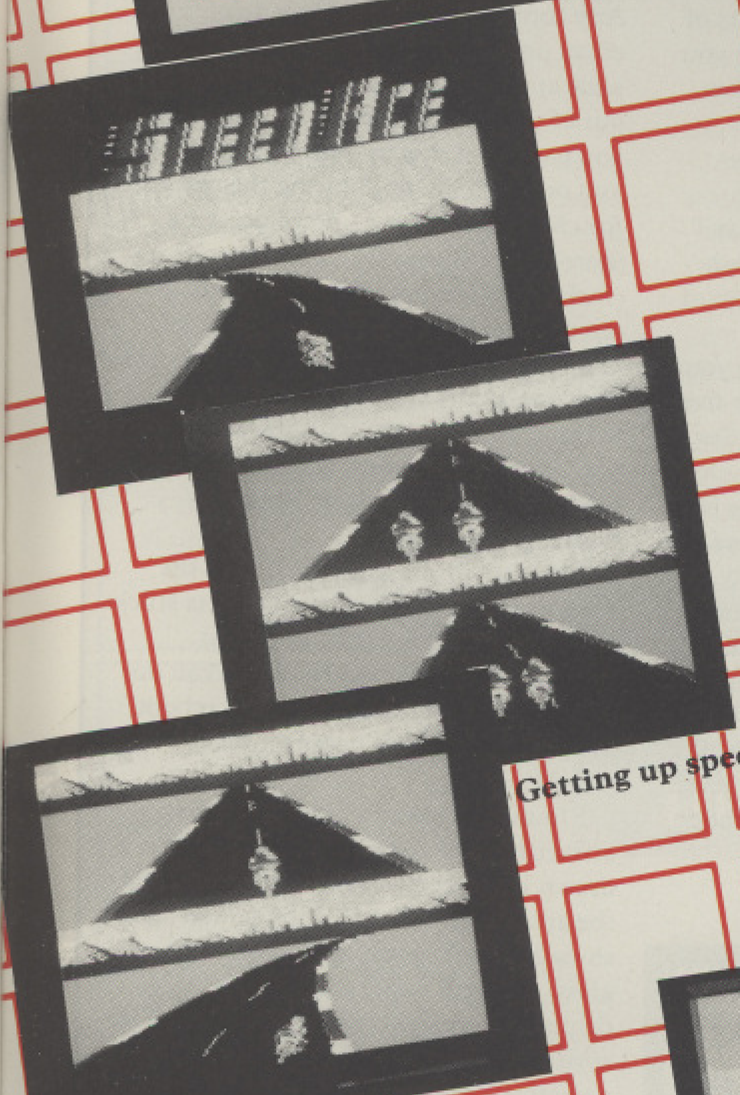
THE SOFTWARE REVIEWS



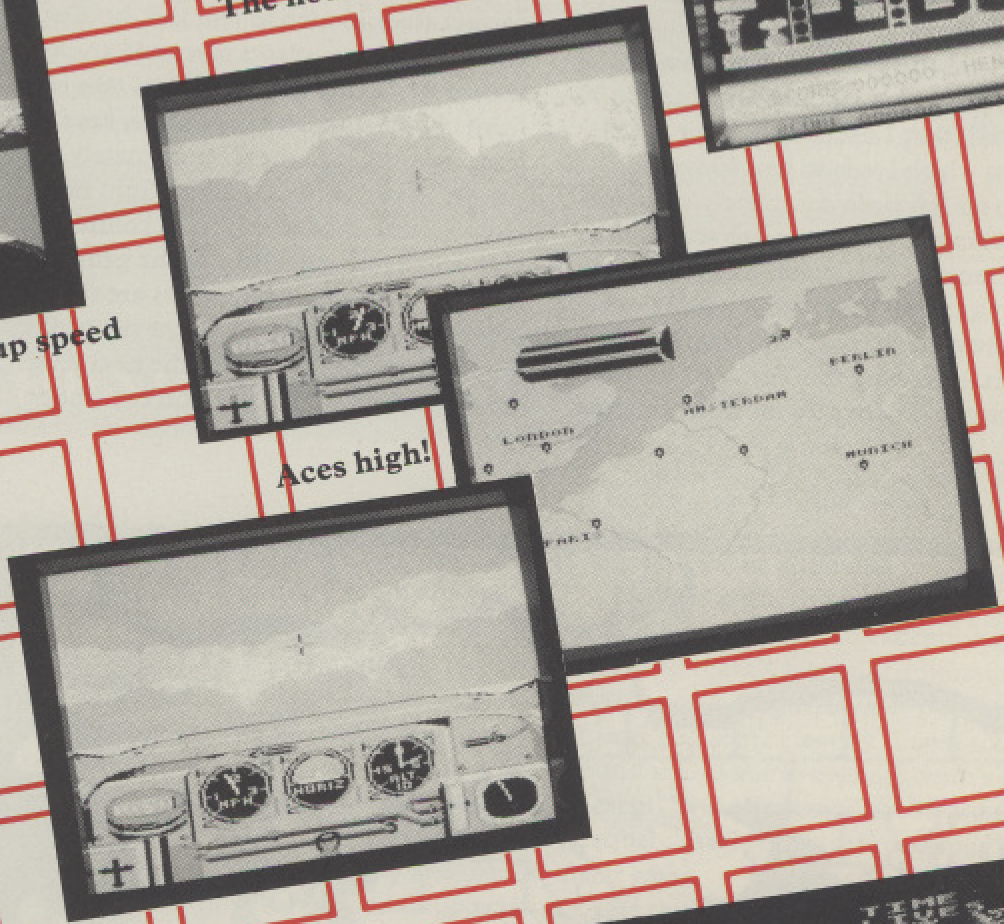
Challenging enough?



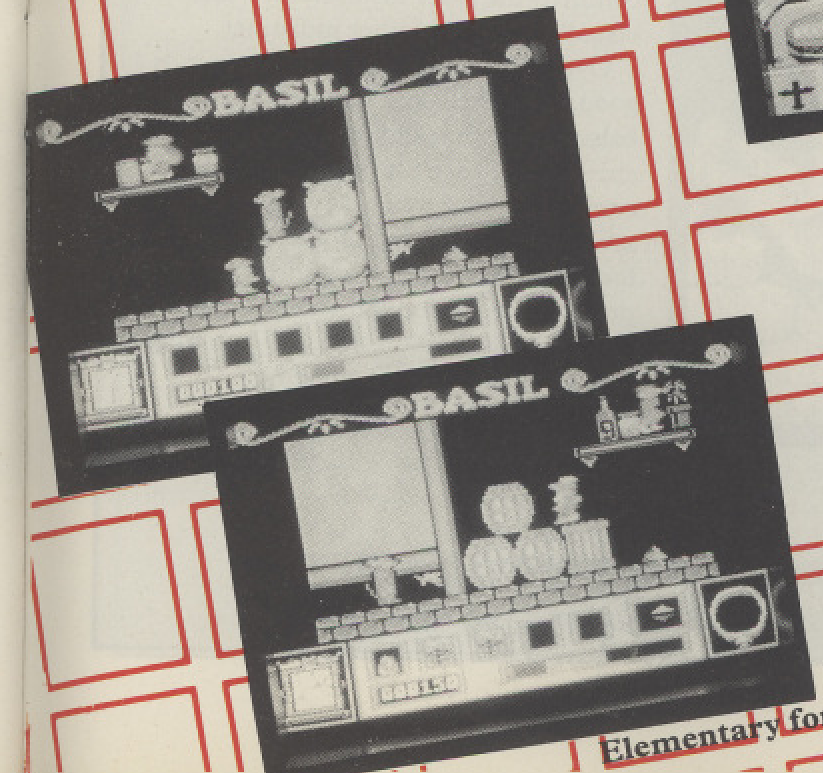
The house where Henry lives



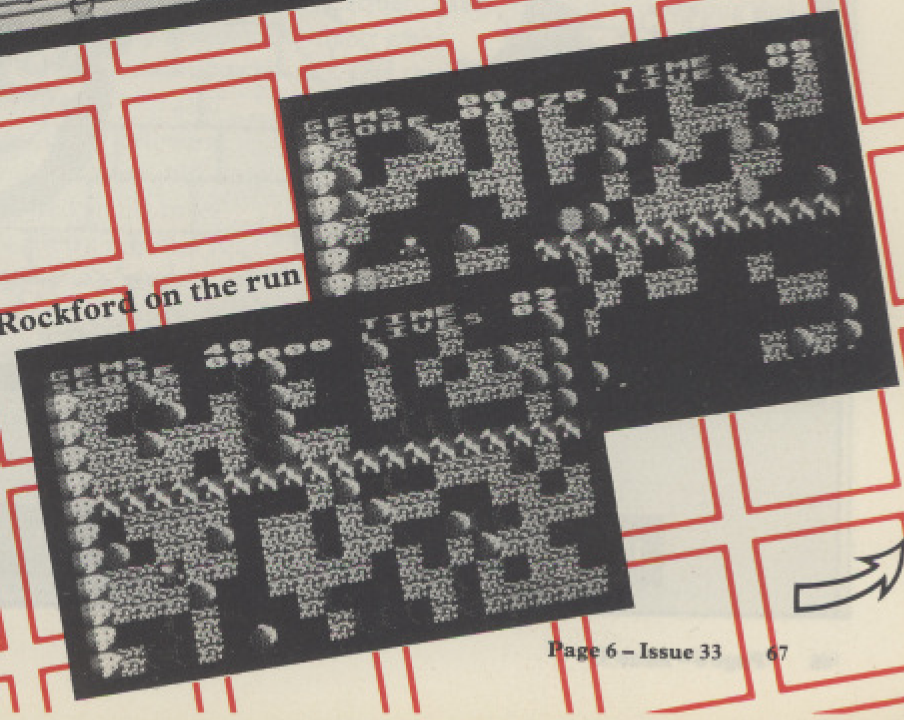
Getting up speed



Aces high!



Elementary for Basil



Rockford on the run

BASIL, THE GREAT MOUSE DETECTIVE

Basil the Mouse lives in the basement of 221B Baker Street and like his esteemed neighbour Sherlock Holmes, Basil is a famous detective. Also like Holmes, Basil has a valued friend and an arch enemy, known respectively as Dr. Dawson and Professor Ratigan. In this game the villainous Ratigan has embarked upon the most sinister criminal plan of his career, during which he kidnapped Dr. Dawson. It's up you, as Basil, to track down and rescue your friend by following clues through some of London's seedier areas to the evil Ratigan's den. The game is based on the Walt Disney film of the same name, so I expected a high quality product. I was not disappointed, and neither was my 6 year old son!

The cassette version had such a ridiculously long loading time (nearly 30 minutes!) that I exchanged it for the disk version which loads in just 50 seconds and so far has been completely reliable. On loading you're treated to some fairly melodramatic music, but this soon gives way to a catchy theme which plays along with the game's credit and high score screens – showing the Top Ten Effective Detectives! There's no music during the game itself, in fact the game is quite restrained in the sound department, being limited to a few bleeps, burbles, and boinks now and again.

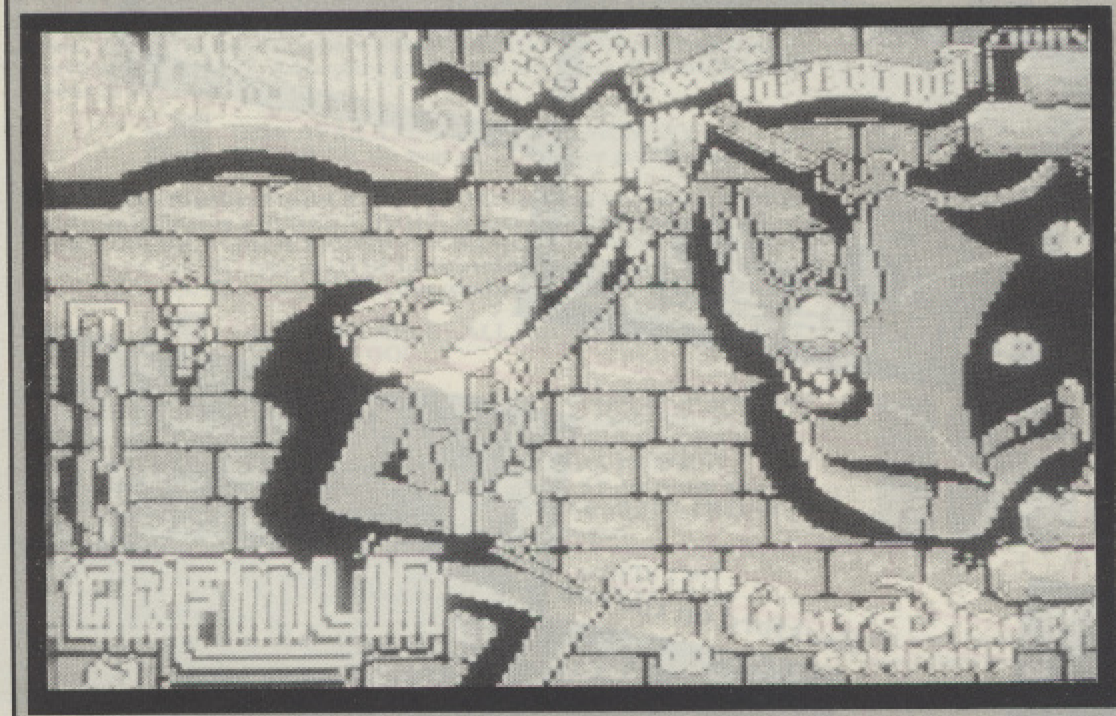
The game is divided into three stages, covering the dockland area, the sewers(!), and Ratigan's den. Each stage consists of several sets of screens, around which you guide Basil using the joystick and a few keyboard controls. Each new screen visited scores 50 points, so the further you get the higher you score. To get from one set of screens to the next Basil has to leap up to and scramble through letterboxes set in doors, the animation of which is quite delightful.

You complete each stage by using your magnifying glass to find and identify five correct clues hidden in jam jars, bottles, chests, and other places scattered around the many playing screens. Clues take the form of objects such as spanners, keys, guns, and other items. Unfortunately, the evil Ratigan has scattered eight false clues around each level just to confuse you, and a major element of the game involves deducing which clues are the genuine ones. Once you've got them all you have to find the exit to the next level. If you get lost on the way you can trade clues for direction hints. The process is repeated for each level until you eventually find Dr. Dawson.

It's not as straightforward as this, of course. Ratigan's henchmen are roaming around trying to stop you finding clues. Any contact with them has a deleterious effect on your strength, as shown on a scale at the bottom of the screen. Run out of strength and the game's over, but you can avoid this by eating the cheese you occasionally find during the search for clues. To add even more pressure there's a time limit for each stage, with a clock at the bottom of the screen to remind you how little time there is left.

Sometimes you'll find mousetraps. No, they don't hurt you, but you can store them in your pockets with the clues you're currently working on and use them later to incapacitate Ratigan's bothersome cronies.

The only problem I found with the game is where Basil sometimes gets stuck in a given location for no apparent reason. When this occurs all you can do is wait for the time to run out or reboot the game. It doesn't happen often, though.



I found the game's graphics rather attractive. The detailed backgrounds are drawn in sixteen shades of brown, while the area at the bottom of the screen showing clock, pockets, magnifying glass, strength scale, and score is displayed in bright primary colours. The sprites depicting Basil dressed in his detective's raincoat and Ratigan's men in their thugs' outfits are beautifully drawn and animated. My only criticism concerns the clues themselves, which visually are often rather indistinct.

Overall, the game looks good, sounds good, plays well, and has just the right balance of action and intellectual challenge to keep players of all ages coming back for more. My six year old son soon got the hang of it and plays it for hours, but younger children would probably find it too difficult without your help. Be careful though – you might just get hooked on it yourself!

John S Davison

Published by Gremlin Graphics – £14.95 on disk – £9.95 on cassette – 1 player

SPEED ACE

SPEED ACE is the first Atari release from the newly formed company Zeppelin Games, and was written by Brian Jobling, who also programmed Tynesoft's Phantom and Mousetrap. This time he has produced a version of the popular arcade game Hang On – a sort of Pole Position on motorbikes!

By necessity the display is very similar to previous race games, with a winding track, grass verges and a scrolling backdrop of buildings and mountains. The motorcyclists are nicely drawn in three colours (red, green and white!) and a sense of motion is achieved by alternate red/white kerb stones and central (green) lines. However, this movement is rather less than smooth so you begin to wonder if your bike has a flat tyre! Judging by the acceleration possible, this is quite a plausible explanation! Apart from these criticisms, the graphics are generally reasonable and, Elektraglide excepted, on a par with the competition.

Controls have been restricted to a minimum. You only need to worry about steering the bike around sharp bends and adjusting your speed as necessary. In fact, it's possible to maintain full throttle all around the circuit providing you take the correct inside line into certain critical corners. The bike will drift heavily as a consequence so you've got to keep a wary eye on opposing riders if you adopt this strategy! A good point here is the way the bike leans over realistically as you negotiate bends. It's not advisable to mount the grass verges or collide with other riders as this reduces your speed dramatically and as I've already hinted, fast acceleration is not one of the bike's notable attributes!

There's a choice of nine different race tracks with famous names such as Paul Ricard, Monza and Silverstone included, each one having different noticeable characteristics which relate to the circuit in real life. Additionally, you can choose the length of the race from one to nine laps, although at least two are needed on most circuits if you want a shot at Pole position. Unlike almost all previous race games, SPEED ACE is a genuine battle to achieve first place – all of the other riders have certain positions in the race and these remain consistent with their movements around you. Mr Jobling is to be congratulated for this major breakthrough!

In addition to the one player game, a two player 'head-to-head' option is available in which the screen splits into two (a la Pitstop II) to represent each player's view. Much as I applaud the inclusion of two player options, this one has a considerably detrimental effect on the speed and manoeuvrability of the bikes, to the extent that I would have been happier in its absence.

As a one player race game I rate SPEED ACE as second only to Activision's Great American Cross Country Road Race, and if Zeppelin are going to continue producing games of this high quality then I recommend you rush out and buy every one!

Paul Rixon

Published by Zeppelin Games – £2.99 on cassette – 1 2 players with joystick(s)

HENRY'S HOUSE

Little Henry has hit upon a spot of bother! He only took a small sip of his chemically minded father's latest liquid concoction but now he is just six inches high and locked inside the broom cupboard, and so he must embark on a desperate quest in search of a cure, avoiding a multitude of obstacles along the way, from terrible toothbrushes through pestiferous parrots and chefs chasing chickens to a final encounter with the vicious vampire!!

This could only be the zany plot to HENRY'S HOUSE, a game that Crummydore owners saw several years ago when it was marketed by (dare I say) English Software, but has now, at long last, been released in Atari format by the budget pioneers Mastertronic. It could be described as a cross between Jet Set Willy and Bounty Bob Strikes Back, but any similarity with the former game is strictly based on concept only, as this one is 100% playable and, quite honestly, a platform enthusiast's delight!

There are eight different levels in the game, each representing a room of Henry's house (funnily enough!). Each room is packed with artifacts and obstacles strewn across a familiar ladders and levels background, together with various traps designed specifically to end Henry's mission, such as low-flying toast in the kitchen, a high speed slipper in the bedroom and a hyper-active cuckoo clock in the lounge! When all necessary objects have been collected, a key is revealed which enables access to the following room. Henry can walk or jump, but only minor falls are permitted so his three lives tend to deplete pretty rapidly. A particularly commendable feature is that you can re-commence the game from the level you previously completed, as opposed to the very beginning. On the negative side, this makes the game a lot easier to complete and once you've conquered all eight rooms you simply return to the first at an apparently identical level of difficulty.

Graphics are nothing less than superb. Colour has been used to exceptional effect and there's plenty of animation together with bright, clearly defined objects and some cleverly drawn scenery. Sound is also above average, with a cheerful 'Rule Brittania' theme tune and adequate sound effects throughout the main game.

The thing that makes HENRY'S HOUSE so refreshing is the liberal injection of humour into the plot and graphics. Small details such as pictures on the television set and nasties lurking in the bathroom all contribute to this favourable impression. Add to this a super little platform game and the result is an incredibly addictive piece of software that should not be missing from your collection!

Paul Rixon

Published by Mastertronic -£1.99 on cassette – 1 player with joystick

ROCKFORD/CRYSTAL RAIDER

'Congratulations, you've just bought the greatest piece of games software ever released' – that's what it said on the inlay card, so naturally I had high expectations as I waited for ROCKFORD – an adaptation of the coin-op arcade version of the classic computer game Boulderdash – to load in.

I was greeted unceremoniously by a text-only title screen accompanied by some music that sounded remarkably as if it had been pinched from International Karate. There were no levels to select or screen options, simply a prompt to press START – so I did. Screen one revealed a familiar background of boulders, walls and glistening gems, superimposed by the famous Rockford character looking absolutely nothing like the cute little dude of old – this was more like Bounty Bob in a Robin Hood outfit! Even worse, everything was coloured in 'Who Dares Wins II style' (i.e. delicate shades of yukkie green and brown!). From then on, gameplay was much the same as Boulderdash, a simple case of accumulating gems to gain access to the subsequent screen. On level two, 'moving walls' were introduced and additional adversaries became evident on levels three and four.

Levels five to eight were different in design and colouring, and according to the instructions I had entered a new world in a series of five, each consisting of four levels. In each new world, Rockford would don a new outfit and take on the role of Cowboy, Hunter, Spaceman, Doctor or Chef. Apart from the cosmetic changes (some of them very good), the game continued to follow the essence of Boulderdash with a liberal selection of nasties, including snakes, fire balls and the ever-faithful amoebas adding to the challenge on higher levels.

Despite my initial reservations I actually found ROCKFORD quite addictive, but in no way did it possess the instant appeal or professional finish of the original Boulderdash, and I do wish Mastertronic hadn't gone quite so O.T.T. with the sales hype. Perhaps their confidence in ROCKFORD isn't really as solid as they would like us to believe. Why else would they re-release another title on the B side of the cassette?

CRYSTAL RAIDER was reviewed fully in PAGE 6 issue 26, and is basically one of those games that involves collecting objects from innumerable rooms, avoiding the inevitable nasties along the way. This is bound to keep you occupied for some time and although the graphics and sound are quite unspectacular, like ROCKFORD the game holds a fair measure of addictiveness. If you don't already have CRYSTAL RAIDER then the package is well worth checking out, but if you want a version of Boulderdash then I'd advise you to seek out the original, which recently re-appeared in budget format courtesy of Prism Leisure Corp. Of course, if you're already a dedicated Boulderdash fanatic then ROCKFORD may well be the challenge you've been waiting for!

Paul Rixon

Published by Mastertronic M.A.D. – £2.99 cassette – 1 player with joystick

LEAGUE CHALLENGE

This fourth Atari release from Atlantis Software marks a departure from their previous trend of following popular arcade themes. As the name suggests, LEAGUE CHALLENGE is a football managerial game and adds to an already extensive list of similar titles on the market. In common with many of these, it's written entirely in Basic and, contrary to the instructions, will only load if Basic is enabled i.e. by pressing START only on powerup. *(Atlantis have already asked us to pass on their apologies for the error. Ed.)*

The main game is presented with standard Gr.0 text on a standard background and uses the INPUT command to extract information from the player. Having chosen a team to manage from the sixty-four available you are first presented with a 'mid-week options menu' from which you can sell unwanted players or view various statistics relating to your team and its financial position. Games may also be saved and recalled from this menu, although unfortunately the high-pitched tones aren't terminated afterwards for the benefit of us poor suffering Rev.B Basic owners!

Next, the intensity of training is selected (thoroughness is proportional to cost) and then it's onto the important task of choosing eleven members of your team to play in the forthcoming match, bearing in mind each player's strength, fitness and ability. The match itself is finally played, albeit in a weird sort of fashion! Your view switches to a representation of the goal and part of the pitch, complete with several stationary players (but no ball!). A white line suddenly emerges from a player's foot and plots a trajectory towards the goal. If it gets past the goalie the result is displayed in the text window. This process repeats for each half of the game, but in a few seconds it's all over and the final result is announced, so don't blink or you'll miss it!

League results are added to a master points table and then you're offered the opportunity to purchase an extra player from the transfer market. Finally, you're reminded of the damage to your bank account with a full analysis of income and expenditure, before returning to the mid-week options menu for another round of the same. The cycle repeats a further fifteen times to the end of the season when your performance is assessed and the team relegated or promoted as appropriate. And then you start again, for even more of the same. It's not an unplayable sequence by any means, but the monotony is such that I hold great admiration for anyone who is still awake by the second season!

Perhaps if the graphics had been better and some sound included, LEAGUE CHALLENGE would have possessed far greater appeal, but Atlantis simply don't seem to have put much effort into producing it. Let's hope they'll stick to those good old arcade themes in future!

Paul Rixon

Published by Atlantis Software – £1.99 on cassette – 1 player – keyboard only

ACE OF ACES

To become an Ace of Aces, you need skill, determination, and a copy of this new American import from U.S.Gold – an absorbing flight combat simulator based around the Second World War which puts you in charge of an RAF Mosquito fighter.

Controlling the Mosquito fully requires interchanging between five different display screens, each representing an area of the aircraft. The Pilot's view houses all the necessary flight instruments including Compass and Radar and gives you control over the yoke and gun or cannon. An icon-intercom system – present on all the screens – acts rather like an on-board tutor, prompting you to take action when necessary. For technical adjustments to the throttle, boost and trim you must relocate to an Engineer's screen. There are two of these, one for each engine. Although there aren't any landings in the game, it's still possible to lower the landing gear to lose airspeed. Set the flaps correctly and you probably won't need to!

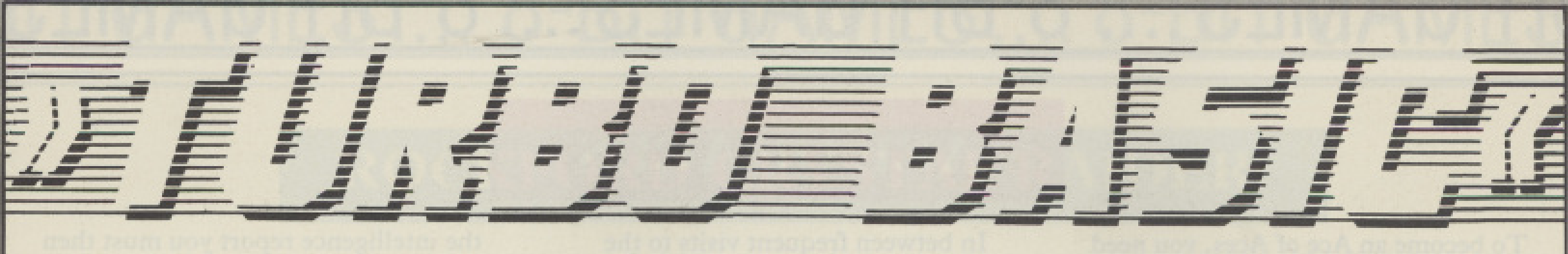
In between frequent visits to the Engineer's department it's important to consult the map of enemy targets throughout Europe and keep an eye on the weather symbols to prevent storm damage. For ground targets, you must move to the Bomb Bay where you can additionally switch weapons and reduce weight by disposing of any empty fuel tanks. The instructions supplied are brief, if not lacking, but fortunately there's a practice option where you can try out all of the major functions. The Mosquito handles rather sluggishly but even so, this experience is horribly addictive!

Select the game proper and you must first choose the number and nature of missions you wish to embark on. Whether you want to annihilate Nazi Bombers and V-1 Buzz Bombs or seek out the U-Boats and Prisoner-of-War trains is entirely your prerogative, but to become an 'Ace of Aces' all of the missions must be chosen simultaneously, and each contributes significantly to the final points allocation. Having inspected the intelligence report you must then collect sufficient supplies of fuel and weaponry and finally study the area map before departure. A successful mission basically involves locating the adversary target, letting rip with the fire button and quickly returning to base. Nazi fighters often intercept you on the way, and must be dealt with in a similar fashion. These always appear on a background of cloudy blue sky, so don't expect any memorable scenery or landmarks! Despite the lack of colour, graphics are generally adequate, with some really slick animation on the Engineer's and Pilot's screens. Sound appears to have been neglected but even this does not detract from the sheer satisfaction of gameplay.

In these days of 'budget' games galore you may think twice before shelling out ten pounds or more, but pause to consider factors such as complexity, addictiveness and lasting appeal and I believe you won't find a better bargain than ACE OF ACES.

Paul Rixon

Published By U.S. Gold – £9.99 on cassette – £14.99 on disk – 1 player with joystick



UNUSUAL ANTICS

by Les Howarth

Here is another unusual demo from Les Howarth who brought you the excellent Magic Window a few issues back. This demo gives an unusual effect by pointing the character set to the ANTIC chip.

HOW IT WORKS

If the character base is set to page 212 (memory location 54272) which is the start of the ANTIC address, printing to the screen in GRAPHICS 1 will actually give GRAPHICS 3 PLOTS in 5 colours. As well as printing to the screen you can also use PLOT and DRAWTO as in this demo. The COLOR statement chooses the character to be printed rather than a colour so COLOR 130 is actually character 130 (Inverse CTRL/B). By experimenting with different characters some weird effects can be obtained.

TURBO COMMANDS

The FILLTO on line 160 is a Turbo Basic command to fill an enclosed area with a color selected by FCOLOR, in this case character 99, which gives a nice jazzy effect. This effect changes if the SELECT key is pressed while a scrolling message is being displayed. The scroll will stop until START is pressed. Use OPTION to end the program.

Note also the frequent use of the percent sign in the listing. In Turbo Basic the numbers 0 to 3 can be used in this way to save memory. Each time these variables are used only one byte is used as opposed to six normally taken when using a number.

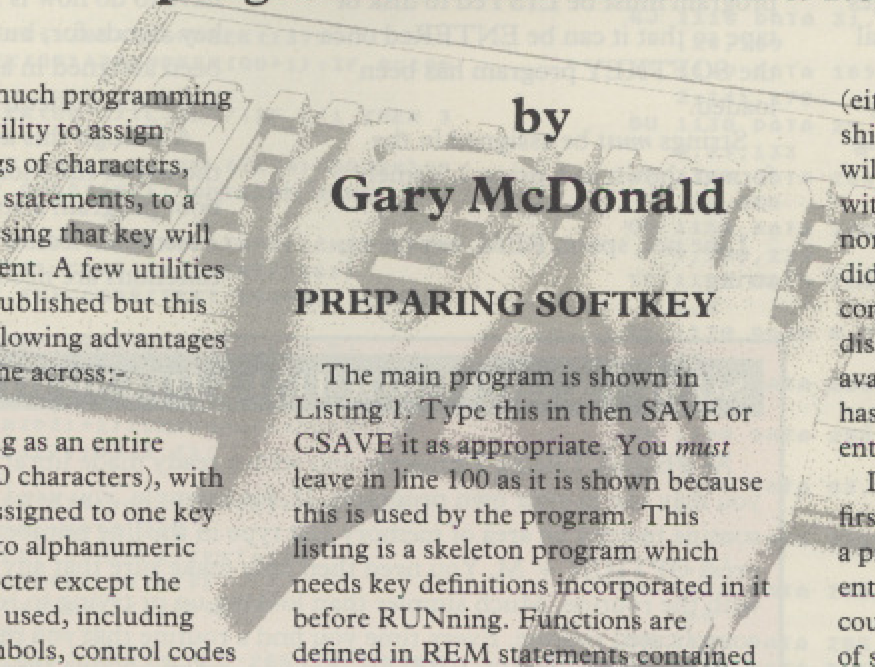
One effect I have added to the demo is a scrolling message using player/missiles. You are alas limited to only 4 characters, 1 for each player, unless the 5th player is enabled of course. The DATA for the characters is taken directly from the resident character set, therefore there is no need to calculate the data yourself. This makes it possible to create any message by simply putting it into A$. PROC MESSAGE starting at line 390 looks at each character in A$ and transfers the necessary data to the P/M area. As players can be moved horizontally quite smoothly in Turbo Basic, it gives the appearance of a nice scrolling message. The player/missile area is initially cleared using the MOVE command as described by Roy Goring in issue 32 .

One more command is introduced on line 90. R=RAND(25) will return an integer random number between 0 and 24. The number in brackets gives the equivalent of INT(RND(0)*25) in Atari basic.

```
QK 1 REM ******************************
CL 2 REM *      Turbo-BASIC Demo      *
ZB 3 REM *             by             *
SG 4 REM *        Les Howarth         *
DZ 5 REM *----------------------------*
HS 6 REM * PAGE 6 Magazine - ENGLAND *
QQ 7 REM ******************************
NN 8 REM
SQ 10 GRAPHICS 17:POKE 756,212:POKE 711,1
   16:POKE 708,8:POKE 710,250
GI 20 DIM A$(20):A$="PAGE*6* DEMO":BT=%1
XF 30 X=10:CHB=57344
BU 40 EXEC SPRITE
SI 50 EXEC SCREEN
FZ 60 EXEC MESSAGE
TH 70 PAUSE 50
LJ 80 FOR I=%1 TO 50
KO 90   R=RAND(25):SOUND %0,R,10,10
RO 100   PAUSE %1:NEXT I:SOUND
PO 110 GO# MOVE_PM
OS 120 ------------------------------
GI 130 PROC SCREEN
GD 140   COLOR 2:PLOT %0,%0:DRAWTO 19,%0:
   DRAWTO 19,23:DRAWTO %0,23:DRAWTO %0,%0
XJ 150   COLOR 130:PLOT %0,%3:DRAWTO 19,%
   3:DRAWTO 19,19:DRAWTO %0,19:DRAWTO %0,
   %3:COLOR 99
JF 160   FCOLOR 99:PLOT %1,4:FILLTO 16,18
   :FILLTO %1,18:FILLTO %1,4
EG 170   COLOR 170:PLOT %2,5:DRAWTO 4,5:P
   LOT %3,5:DRAWTO %3,10
DL 180   PLOT 5,11:DRAWTO 5,16:DRAWTO 7,1
   6:DRAWTO 7,11
YP 190   PLOT 8,10:DRAWTO 8,5:DRAWTO 9,5:
   DRAWTO 10,6:DRAWTO 9,7:DRAWTO 10,8:DRA
   WTO 10,10
ET 200   PLOT 11,16:DRAWTO 11,11:DRAWTO 1
   2,11:DRAWTO 13,12:DRAWTO 12,13:DRAWTO
   13,14:DRAWTO 13,15:DRAWTO 12,16
CX 210   PLOT 14,10:DRAWTO 14,5:DRAWTO 16
   ,5:DRAWTO 16,10:DRAWTO 14,10
VO 220 ENDPROC
OV 230 ------------------------------
NM 240 # MOVE_PM
VU 250 DO
DX 260   IF PEEK(53279)=%3 THEN 550
IP 270   IF PEEK(53279)=5 THEN EXEC WAIT
QJ 280   POKE 53248,X:POKE 53249,X+8:POKE
    53250,X+16:POKE 53251,X+24:X=X+%1:PAU
   SE 0.2
MC 290   IF X>218 THEN X=10:EXEC MESSAGE
QW 300 LOOP
OS 310 ------------------------------
QS 320 PROC SPRITE
DQ 330   T=PEEK(106)-16:FOR I=704 TO 707:
   POKE I,14:NEXT I:POKE 559,62:A=T*256
FS 340   MOVE 20000,A,2048
MT 350   POKE 54279,T:POKE 53277,3:A=A+11
   40
JF 360   POKE 623,%1:A1=A
VZ 370 ENDPROC
PG 380 ------------------------------
XD 390 PROC MESSAGE
QL 400   IF BT>LEN(A$) THEN BT=1
HW 410   FOR T=0 TO 3
XI 420     C=(ASC(A$(BT,BT))-32)*8+CHB
CN 430     FOR I=0 TO 7
IK 440       POKE A+I,PEEK(C+I)
ZK 450     NEXT I
PM 460     BT=BT+1:A=A+256
WG 470   NEXT T:PAUSE 2:A=A1
WC 480 ENDPROC
PJ 490 ------------------------------
GD 500 PROC WAIT
CO 510   IF PEEK(53279)=6 THEN 530
ND 520   GOTO 510
VT 530 ENDPROC
PA 540 ------------------------------
JO 550 FOR I=53248 TO 53251:POKE I,0:NEXT
    I:END
PE 560 ------------------------------
```

SOFTKEY

A superb utility to add instant commands, text or even whole subroutines to your programs at the touch of a key



by

Gary McDonald

Anyone who does much programming will appreciate the facility to assign commonly used strings of characters, such as programming statements, to a single key so that pressing that key will type the entire statement. A few utilities to do this have been published but this program offers the following advantages over others I have come across:-

- Strings can be as long as an entire program line (over 100 characters), with multiple statements assigned to one key
- You are not limited to alphanumeric characters – any character except the RETURN key can be used, including commas, graphics symbols, control codes and inverse characters. So even machine code functions and printer controls can be assigned
- Up to 26 different assignments can be used at any one time, one for each alphabetic key (A-Z)
- The string is called by pressing the appropriate alphabetic key and the OPTION key simultaneously, so you still retain the normal, shift- and control-combinations of that key (some utilities of this type often use one of these combinations to print the string, thereby losing the normal operation of that key combination)
- You can make up your own different sets of key functions and save and load them as appropriate.

The program provides for both tape and disk versions, so tape-only users can also enjoy the benefits of this facility. Even if you are not interested in the program as such, the article may still be worth reading as it demonstrates two useful programming techniques, one which allows a 'non- relocatable' machine code program to be relocated in steps of whole pages and another which overcomes the inability of the DATA statement to handle an embedded comma, a technique I have never seen published before.

PREPARING SOFTKEY

The main program is shown in Listing 1. Type this in then SAVE or CSAVE it as appropriate. You *must* leave in line 100 as it is shown because this is used by the program. This listing is a skeleton program which needs key definitions incorporated in it before RUNning. Functions are defined in REM statements contained in program lines in the range 0 – 99 which you can either add directly to the skeleton program and then (C)SAVE as a new version, or make into separate programs which can be LISTed to disk or tape and later merged with SOFTKEY by ENTERing. Some examples are shown in Listing 2 but you do not necessarily have to use these – you can of course devise your own functions to suit your particular needs.

When SOFTKEY (augmented by the key assignments as described above) is RUN it will create a machine code program and save it either as an AUTORUN.SYS disk file or as a bootable tape file (or both!), whichever you specify (multiple copies can be made simply by following the prompts). To use the functions you then have to switch off the computer and reboot (with BASIC installed). If you are using tape, remember to hold down the START key at the same time as switching on the computer then press the recorder's PLAY key followed by RETURN to load the boot tape. When the program has loaded, either from disk or tape, the familiar BASIC 'READY' prompt will appear.

From then on, whenever you hold down the OPTION key and an appropriate alphabetic key together (either in lower-case mode or with shift, caps-lock or control) your string will be printed. Any key combination without the OPTION key will print as normal, as will any key to which you did not assign a string. For convenience, auto-repeat has been disabled in OPTION mode but is still available in normal use. After the string has been printed, press RETURN to enter it.

Don't forget to type a line number first if you want the string to be part of a program line, otherwise it will be entered in command mode. You can of course enter it in the middle of a group of statements – just enter the rest normally and call up your key function at the appropriate point. If you intend to follow it with more statements on the same line, don't forget to add a colon delimiter if appropriate.

The keys will continue to work in this way even after a RESET, but strange results can arise if you call DOS. If you still wish to use DOS, delete Line 660 from SOFTKEY before RUNning it but you will then lose the function keys after a RESET. In any event, some DOS functions will overwrite the machine code and cause a crash when you return to BASIC.

RELOCATING THE OBJECT CODE

The machine code program loads into low memory (after DOS for disk users) before BASIC is installed, and the lower down it is the more RAM is available for BASIC (Page 6 of RAM is not affected). It makes sense to load in as low as reasonably possible, but this will vary depending on your system configuration (number of disk drives, file buffers, etc.) so SOFTKEY is flexible enough to allow you to specify the loading point to the nearest page boundary (a page is a block of 256 bytes). To determine the lowest →

address, switch on your computer in its normal operating mode (without the SOFTKEY AUTORUN or boot tape programs) and type PRINT PEEK(744). Add 1 to this number to derive a suitable load address and change Line 140 as necessary from ORG=30 to your new number. PEEK(744) normally gives 7 for a tape-only system and 28 for a single disk drive.

Line 150 alters all those bytes of the machine code routine which depend on the start address and effectively moves the routine by a whole number of pages up or down in memory from a nominal address of Page 29. The bytes which have to be altered were determined by assembling the source code twice using two different starting addresses, the second one page higher than the first, and then comparing the two sets of resulting object code and noting which bytes were different and how they compared with the starting address. This data is contained in Lines 2000 and 3000 and is read into string arrays RLP$ and RLO$.

A DIFFERENT WAY OF HANDLING DATA

The second unusual feature of the program is the way the data for the string assignments are incorporated into the program. The natural choice would be to use DATA statements but if you wish to incorporate a comma in your string (which can arise frequently – when opening files, using arrays, POKEing, etc) the READ statement would only read as far as the comma and ignore the rest – in fact it would read everything after the comma as the next set of data which would not be the intention. The REM statement overcomes this restriction but I had to write a special routine to access the data directly from the program lines stored in the computer's memory.

Line 200 of SOFTKEY determines the address of the first statement in the program and Line 210 then reads the line number. If this is 100 any lines between 0 and 99 will already have been examined and the program branches to Line 400 to write the code to disk or tape. Otherwise, Line 220 calculates the length of the line and bypasses any further processing if the line is empty. Lines 230 to 320 check that the key label is within range and if so incorporates its definition in a table in the machine code. Finally, Line 330 finds the address of the next line number before looping back to Line 210 to process it.

DEFINING YOUR OWN KEYS

As stated earlier, Listing 2 is just an example of the way you may define keys. You can assign almost any statement to a key from your own name through to often used keywords up to full one line routines. Defining keys simply requires you to create a program consisting of REM statements using line numbers up to a maximum of 99 which can then be merged with the main SOFTKEY program. This program must be LISTed to disk or tape so that it can be ENTERed once the SOFTKEY program has been loaded.

Strings *must* be assigned in the format shown in Listing 2, namely

Line no., space, REM, key (A-z), string.

Note that there are no spaces between the key label and the assigned string (unless you want leading spaces as part of your string). A new line should be used for each key. They need not be entered in alphabetical order, but it is tidier if they are.

I hope you find this program as useful as I have. It obviates the tedium of keying in commonly used statements time and time again, reduces the chances of error and saves time. All you have to do now is remember what each key stands for, but if the functions have been assigned in a meaningful way this is not too difficult.

Although this article has described the use of function keys in BASIC, the boot program also works with the Assembler/Editor cartridge (different functions are needed of course).

SOME EXAMPLE ROUTINES TO USE WITH SOFTKEY

As a bonus, Listing 2 presents you with a ready made library of subroutines that you may use in your own programs. If, for example, you need a machine code routine to copy an area of memory just type in the line number you wish to use and press OPTION + M. You need then only make sure that any variables used tie up with the routine. Much simpler than looking up or trying to remember a complicated routine. Every time you find a routine that you might use again you can amend the SOFTKEY program and create your own library of routines for use in your programming sessions. Brief descriptions of the functions defined in Listing 2 with the key to which they have been allocated are as follows:-

B – Dimensions a string B$ to 200 bytes and sets all elements to zero (Atari heart symbol)
C – Closes Channel 1
D – Lists the directory of Drive 1 without having to go to DOS
H – Calculates the high byte of variable V
I – A machine code routine to send or receive data from a device – can be used to read files. Open the device first (e.g. OPEN £1,4,0,'D:XXX'), set up a buffer to receive the data (a string for example) then call the routine with the USR function passing the following parameters – channel number, transmission direction (7 for read, 11 for write), buffer address and number of bytes
J – Print the 2 low-order bytes of the internal clock in jiffies (units of time approximately equal to 1/50 second in the UK)
K – Wait for a key to be pressed and store its ATASCII value in K
L – Calculate the low byte of variable V
M – A machine code routine to copy an area of memory to a non-overlapping region. Call with the USR function with parameters – number of bytes to copy, from address and to address
O – Open a device – don't forget to insert its name after the quotation mark
P – Print string A$ to the screen showing any control characters in their symbolic form
R – Lower RAMTOP to Page 96 to reserve memory
S – Another machine code routine. This one reads or writes any number of single or enhanced density disk sectors to or from a buffer. Call with the USR function and pass parameters – buffer address (a string?), starting sector number, number of sectors and direction of transfer (82 for read, 87 for write). Only use the write facility if you really know what you are doing as you can easily mess up the disk, destroy valuable data and make it impossible to recover
V – Set the variable VDU to the screen address
Z – Set the internal clock to zero – both POKEs to location 20 are intentional

```
NT 100 REM DO NOT DELETE THIS LINE
LX 101 REM ******************************
IU 102 REM *          SOFTKEY           *
LW 103 REM *            by              *
OA 104 REM *       Gary McDonald        *
GA 105 REM *----------------------------*
JZ 106 REM * PAGE 6 Magazine - ENGLAND *
MP 107 REM ******************************
RK 108 REM
PW 110 DIM A$(313):RESTORE 1000:FOR I=1 T
   O 313:READ J:A$(I,I)=CHR$(J):NEXT I
GX 120 DIM RLP$(20):RESTORE 2000:FOR I=1
   TO 20:READ J:RLP$(I,I)=CHR$(J):NEXT I
FM 130 DIM RLO$(20):RESTORE 3000:FOR I=1
   TO 20:READ J:RLO$(I,I)=CHR$(J):NEXT I
UM 140 ORG=30
JL 150 FOR I=1 TO 20:K=ASC(RLP$(I)):A$(K,
   K)=CHR$(ORG+ASC(RLO$(I))):NEXT I
UI 160 DIM D$(120),DT$(26*120)
ZJ 170 TEXT=ORG*256+313
TE 180 ? :?
IH 200 QQ=PEEK(136)+256*PEEK(137)
XQ 210 Q=PEEK(QQ)+256*PEEK(QQ+1):IF Q=100
    THEN 400
IG 220 QL=PEEK(QQ+2):L=QL-7:IF L<1 THEN 3
   30
CH 230 K=PEEK(QQ+5)-65:IF ((K<0) OR (K>25
   )) THEN ? CHR$(253);"OUTSIDE RANGE A-Z
   ":END
QL 240 IX=236+3*K:A$(IX+2,IX+2)=CHR$(L):A
   $(IX+1,IX+1)=CHR$(INT(TEXT/256))
AJ 250 A$(IX,IX)=CHR$(TEXT-256*INT(TEXT/2
   56))
NI 260 ? "KEY ";CHR$(K+65+128);" ";
YR 270 D$=""
CI 280 FOR I=1 TO L
LM 290 D$(LEN(D$)+1)=CHR$(PEEK(QQ+5+I))
VU 300 ? CHR$(27);D$(I,I);
HL 310 NEXT I:?
OH 320 DT$(LEN(DT$)+1)=D$:TEXT=TEXT+L
LF 330 QQ=QQ+QL:GOTO 210
XX 400 FIN=TEXT-1:MEMLO=TEXT+128
RD 410 TB=LEN(A$)+LEN(DT$)
MP 420 NB=INT((TB-1)/128)+1
AK 430 RD=NB*128-TB
WV 440 A$(62,62)=CHR$(MEMLO-256*INT(MEMLO
   /256)):A$(67,67)=CHR$(INT(MEMLO/256))
TB 450 ? :?
NV 460 ? "MAKE BOOT DISK (D)?"
AT 470 ? "MAKE BOOT TAPE (T)?"
UE 480 ? "QUIT              (Q)?":?
QW 490 CLOSE #1:OPEN #1,4,0,"K:":GET #1,I
JO 500 IF I=ASC("D") THEN GOSUB 600:GOTO
   450
UA 510 IF I=ASC("T") THEN GOSUB 700:GOTO
   450
MC 520 IF I<>ASC("Q") THEN 440
OA 530 END
OC 600 CLOSE #1:OPEN #1,8,0,"D:AUTORUN.SY
   S"
DD 610 PUT #1,255:PUT #1,255
PF 620 PUT #1,0:PUT #1,ORG
JL 630 PUT #1,FIN-256*INT(FIN/256):PUT #1
   ,INT(FIN/256)
GN 640 FOR I=1 TO LEN(A$):PUT #1,ASC(A$(I
   )):NEXT I
CN 650 FOR I=1 TO LEN(DT$):PUT #1,ASC(DT$
   (I)):NEXT I
BR 660 PUT #1,226:PUT #1,2:PUT #1,227:PUT
    #1,2:PUT #1,0:PUT #1,ORG
AW 670 PUT #1,224:PUT #1,2:PUT #1,225:PUT
    #1,2:PUT #1,22:PUT #1,ORG
HS 680 CLOSE #1:RETURN
LJ 700 CLOSE #1:OPEN #1,8,128,"C:"
QA 710 PUT #1,0:PUT #1,NB
PG 720 PUT #1,0:PUT #1,ORG
QD 730 PUT #1,22:PUT #1,ORG
WK 740 RESTORE 4000
RG 750 FOR I=1 TO 16:READ J:IF I=11 THEN
   J=ORG
VI 760 PUT #1,J:NEXT I
IT 770 FOR I=23 TO LEN(A$):PUT #1,ASC(A$(
   I)):NEXT I
CU 780 FOR I=1 TO LEN(DT$):PUT #1,ASC(DT$
   (I)):NEXT I
PC 790 IF RD>0 THEN FOR I=1 TO RD:PUT #1,
   0:NEXT I
HE 800 CLOSE #1:RETURN
FM 1000 DATA 165,12,141,20,29,165,13,141,
   21,29
BH 1010 DATA 169,19,133,12,169,29,133,13,
   96,32
XY 1020 DATA 255,255,173,8,2,141,107,29,1
   73,9
WQ 1030 DATA 2,141,108,29,169,71,141,8,2,
   169
RT 1040 DATA 29,141,9,2,174,22,228,172,23
   ,228
YQ 1050 DATA 232,208,1,200,142,149,29,140
   ,150,29
CP 1060 DATA 169,57,141,231,2,169,30,141,
   232,2
IC 1070 DATA 96,165,66,208,31,173,31,208,
   201,3
HD 1080 DATA 208,24,238,168,29,152,72,173
   ,9,210
DW 1090 DATA 41,63,168,185,171,29,201,91,
   176,4
NB 1100 DATA 201,65,176,5,104,168,76,255,
   255,41
GJ 1110 DATA 31,168,136,152,141,169,29,10
   ,24,109
HS 1120 DATA 169,29,168,185,237,29,240,23
   2,141,170
BU 1130 DATA 29,185,235,29,133,203,185,23
   6,29,133
JP 1140 DATA 204,160,0,177,203,140,169,29
   ,32,255
OD 1150 DATA 255,172,169,29,200,204,170,2
   9,208,239
YI 1160 DATA 169,0,133,77,104,168,104,64,
   0,0
OK 1170 DATA 0,76,74,59,255,255,75,43,42,
   79
UR 1180 DATA 255,80,85,255,73,45,61,86,25
   5,67
IN 1190 DATA 255,255,66,88,90,52,255,51,5
   4,27
OY 1200 DATA 53,50,49,44,32,46,78,255,77,
   47
KA 1210 DATA 255,82,255,69,89,255,84,87,8
   1,57
HA 1220 DATA 255,48,55,255,56,60,62,70,72
   ,68
CO 1230 DATA 255,255,71,83,65,0,0,0,0,0
MZ 1240 DATA 0,0,0,0,0,0,0,0,0,0
NC 1250 DATA 0,0,0,0,0,0,0,0,0,0
NF 1260 DATA 0,0,0,0,0,0,0,0,0,0
NI 1270 DATA 0,0,0,0,0,0,0,0,0,0
NL 1280 DATA 0,0,0,0,0,0,0,0,0,0
NO 1290 DATA 0,0,0,0,0,0,0,0,0,0
MP 1300 DATA 0,0,0,0,0,0,0,0,0,0
AW 1310 DATA 0,0,0
IQ 2000 DATA 5,10,16,28,34,41,57,60,67,85
   ,96,117,122,126,131,134,139,148,154,15
   8
HY 3000 DATA 0,0,0,0,0,0,0,0,1,0,0,0,0,0,
   0,0,0,0,0,0
IF 4000 DATA 169,60,141,2,211,169,22,133,
   10,169,29,133,11,24,234,96
```

LISTING 2

```
GR 12 REM BDIM B$(200):B$="♥":B$(200)="♥"
   :B$(2)=B$
WQ 13 REM CCLOSE #1
RX 14 REM D?:CLOSE #7:OPEN #7,6,0,"D:*.*"
   :FOR I=1 TO 2000:GET #7,A:? CHR$(A);:N
   EXT I:CLOSE #7
PU 18 REM HHI=INT(V/256)
HF 19 REM IDIM I$(39):I$="hhh[illegible]hh[illegible]B h[illegible]
   E h[illegible]D h[illegible]I h[illegible]H  V[illegible]T ♥[illegible]U♦":REM #,7/11,A
   DR,SIZ
DX 20 REM J?:?"JIFFS=";PEEK(19)*256+PEEK(
   20)
TB 21 REM KCLOSE #1:OPEN #1,4,0,"K:":GET
   #1,K
CN 22 REM LLO=V-256*INT(V/256)
KU 23 REM MDIM M$(52):M$="hh,Ph,Oh,Lh,Kh,
   Nh,H ♥&Pp_1K,MHPvfL fNJPr&Op/1K,MHJPx♦"
   :REM #/FROM/TO
SQ 25 REM OOPEN #1,4,0,"
BG 26 REM PFOR I=1 TO LEN(A$):?CHR$(27);A
   $(I,I);:NEXT I
XB 28 REM RPOKE 106,96:GRAPHICS 0
JQ 29 REM SDIM S$(72):S$="hh[illegible]h[illegible]h[illegible]h[illegible]
   [illegible]h,LfLh,Khh[illegible]S[illegible]dn[illegible]P[illegible]i[illegible]
   [illegible]i♥[illegible]FKP♦FLP\♦":REM BF,ST,#,82/87
TR 32 REM VVDU=PEEK(88)+256*PEEK(89)
MV 36 REM ZPOKE 20,0:POKE 19,0:POKE 18,0:
   POKE 20,0
```

6. FAST TRIG FUNCTIONS and HEX/DEC CONVERSION

Ian Finlayson shows you how to speed up maths functions and offers a handy conversion routine

I was intending for this issue to concentrate on a fast trigonometry technique to speed your graph drawing programs, but I have changed my mind! Once you understand the principle of the technique the applications are quite easy, so I will not labour the point. Instead I will lay the ground rules, show an example and leave you to find applications. This will leave me enough space (and time) to provide two additional useful subroutines for decimal to Hex and Hex to Dec conversion.

SPEED UP SINES

The Atari 8 bit computers are overall the best of their type, but this does not mean they are perfect and one weakness is the slow speed of mathematical and trigonometric functions in Basic. It is worth finding quite tortuous ways of avoiding these functions if you want to speed up your programs. One way to do this is to do all your calculation in advance during an initialisation sequence at the start of your program and then merely call up the results when you want them in the part of your program where speed is required. Many programs have a delay at the start during initialisation, and this is far more acceptable than a program that seems to drag itself along slowly all the way through.

I have taken the SIN function as an example. The subroutine is only two lines 31800 and 31801. The first line checks whether the array has already been set up as it is a waste of time to re-initialise if the values are still intact as could happen on a program restart. In the second line of the subroutine the value of SIN(A) is calculated for each whole degree from zero to 90 and the result is stored in the array SSIN(A). It is as simple as that! From here on you can use SSIN just as if you were using SIN as long as you remember the limitations ... it only works for those values that have been set up i.e. whole degrees between 0 and 90. SSIN(1.4) will return a value equal to SIN(1), the nearest whole number, and numbers outside the 0-90 range will cause a string length or value error message.

As an illustration of the technique the short graphic program draws two sets of circles and two sets of sine waves to form a simple pattern in Graphics 8. It uses SIN for the first set of curves and SSIN for the second set in each case. This shows that the use of SSIN makes the drawing process about twice as fast (ignoring the initialisation time). You can also see that the one SSIN range can be used to fulfill the requirements for a full 360 degrees of both Sines and Cosines.

If you do not use a full range of values of SSIN (or equivalent function) in your application it is worth going back to the subroutine and changing it so that only the values you need are defined. This can significantly shorten the delay during initialisation.

HEX TO DEC AND DEC TO HEX CONVERSIONS

These two utility subroutines do not contain any startling programming techniques, but they are good examples of compact use of Basic programming. I will not describe them in too much detail but leave you to follow them through and see how they work. In each of the routines the first two lines test to see if the subroutine has been called before and the respective string (TT12$ or TT13$) is dimensioned only if it has not been done already.

In the main body of each program the trick is to know how to handle the transformation between values of letters and numbers. The value obtained when the keyboard key number 2 is pressed is not 2, nor does the character A have a value of 11 so all have to be manipulated to meet our requirements. For each key pressed on the keyboard there are three values used in the computer. First the ASCII value, or to be more strict the ATASCII value (which covers the Atari specific graphics characters beyond the standard ASCII set). Second is the ICODE value which is the value which is used to generate the character on screen, if you poke the ICODE value into screen memory the required character will appear. Last is the keycode value which is generated when a key is pressed, this can be found by PEEKing location 764. In the back of Compute's Third Book of Atari is an appendix which gives comprehensive information on the Atari character set, it is a most useful reference which has helped me frequently.

In these subroutines we are using the ASCII values of the characters to obtain a decimal value from a HEX string. The numerals 0 to 9 have ASCII values 48 to 57 and the letters we need, A to F have values 65 to 70 so we have to subtract 48 from the numbers and 55 from the letters to obtain the numerical value of the Hex character. Similarly, when converting from decimal to hexadecimal the 48 or 55 has to be added on to get the ASCII value. In each case the whole sequence 0 to F can not be handled as one but has to be split into numerical and alphabetical portions. For compactness, and to illustrate that there is another way of converting numbers from string characters to numeric values, I have used STR$ to obtain the Hex numeric characters from their respective numbers and VAL to get the numeric value from

```
WO 1 REM ********************************
WL 2 REM * GRAPHICS DEMO for PAGE 6     *
WT 3 REM * SUBROUTINE TUTORIAL 6        *
OH 4 REM * by Ian Finlayson             *
WS 5 REM ********************************
CY 10 GRAPHICS 8:X=80:Y=80:R=70:COLOR 1:G
   OSUB 31800
NP 20 FOR R=20 TO 70 STEP 10:FOR A=0 TO 4
   5:XX=R*SIN(A):YY=R*SIN(90-A)
DV 30 PLOT X+XX,Y-YY:PLOT X+XX,Y+YY:PLOT
   X-XX,Y-YY:PLOT X-XX,Y+YY
KC 40 PLOT X+YY,Y+XX:PLOT X-YY,Y+XX:PLOT
   X+YY,Y-XX:PLOT X-YY,Y-XX:NEXT A:NEXT R
LO 50 FOR R=20 TO 70 STEP 10:X=240:FOR A=
   0 TO 45:XX=R*SSIN(A):YY=R*SSIN(90-A)
DY 60 PLOT X+XX,Y-YY:PLOT X+XX,Y+YY:PLOT
   X-XX,Y-YY:PLOT X-XX,Y+YY
KF 70 PLOT X+YY,Y+XX:PLOT X-YY,Y+XX:PLOT
   X+YY,Y-XX:PLOT X-YY,Y-XX:NEXT A:NEXT R
RJ 80 FOR R=20 TO 70 STEP 10:PLOT 0,80
CC 90 FOR X=1 TO 90 STEP 3:DRAWTO X*8/9,8
   0-R*SIN(X):NEXT X
EZ 100 FOR X=91 TO 180 STEP 3:DRAWTO X*8/
   9,80-R*SIN(180-X):NEXT X
IW 110 FOR X=181 TO 270 STEP 3:DRAWTO X*8
   /9,80+R*SIN(X-180):NEXT X
FC 120 FOR X=271 TO 360 STEP 3:DRAWTO X*8
   /9,80+R*SIN(360-X):NEXT X:NEXT R
MQ 130 FOR R=20 TO 70 STEP 10:PLOT 0,80:F
   OR X=1 TO 90 STEP 3:DRAWTO X*8/9,80+R*
   SSIN(X):NEXT X
JB 140 FOR X=91 TO 180 STEP 3:DRAWTO X*8/
   9,80+R*SSIN(180-X):NEXT X
WV 150 FOR X=181 TO 270 STEP 3:DRAWTO X*8
   /9,80-R*SSIN(X-180):NEXT X
LY 160 FOR X=271 TO 360 STEP 3:DRAWTO X*8
   /9,80-R*SSIN(360-X):NEXT X:NEXT R
OE 170 END


EQ 31799 REM **          PAGE 6          **
             ** SUBROUTINE TUTORIAL-6 **
             ** SINE FUNCTION IN ARRAY**
SM 31800 IF SSIN THEN RETURN
EU 31801 DEG :DIM SSIN(90):FOR A=1 TO 90:
   SSIN(A)=SIN(A):NEXT A:RETURN
AX 31808 REM **          PAGE 6          **
             ** SUBROUTINE TUTORIAL-6 **
             **  DEC TO HEX CONVERTER **
HW 31809 REM ** CONVERTS DECIMAL VALUE**
             ** IN "NUMBER" TO HEX IN **
             **     STRING TT12$       **
PK 31810 TT17=6:IF USED THEN 31830
VM 31820 USED=1:DIM TT12$(TT17)
EA 31830 TT18=NUMBER:TT19=INT(NUMBER/16):
   TT18=TT18-TT19*16
BJ 31840 IF TT18<10 THEN TT12$(TT17,TT17)
   =STR$(TT18):GOTO 31860
BQ 31850 TT12$(TT17,TT17)=CHR$(TT18-10+AS
   C("A"))
WY 31860 IF TT19<>0 THEN NUMBER=TT19:TT17
   =TT17-1:GOTO 31830
JV 31870 TT12$=TT12$(TT17,6):? TT12$:RETU
   RN
VG 31878 REM **          PAGE 6          **
             ** SUBROUTINE TUTORIAL-6 **
             **  HEX TO DEC CONVERTER **
ZM 31879 REM **   CONVERTS HEX NO IN   **
             ** STRING HX$ AND RETURNS**
             **    DEC VALUE IN TT20   **
UL 31880 TT20=0:IF USED1 THEN 31900
IY 31890 USED1=1:DIM TT13$(1)
BJ 31900 FOR COUNT=1 TO LEN(HX$)
QG 31910 TT13$=HX$(COUNT,COUNT):IF TT13$<
   "0" THEN POP :GOTO 31960
LE 31920 IF TT13$<="9" THEN TT20=TT20*16+
   VAL(TT13$):GOTO 31950
YE 31930 IF TT13$<"A" OR TT13$>"F" THEN P
   OP :GOTO 31960
XN 31940 TT20=TT20*16+ASC(TT13$)-ASC("A")
   +10
EH 31950 NEXT COUNT:? TT20:RETURN
RQ 31960 ? "NOT A HEX NUMBER":RETURN
```

the numerals in the Hex strings.

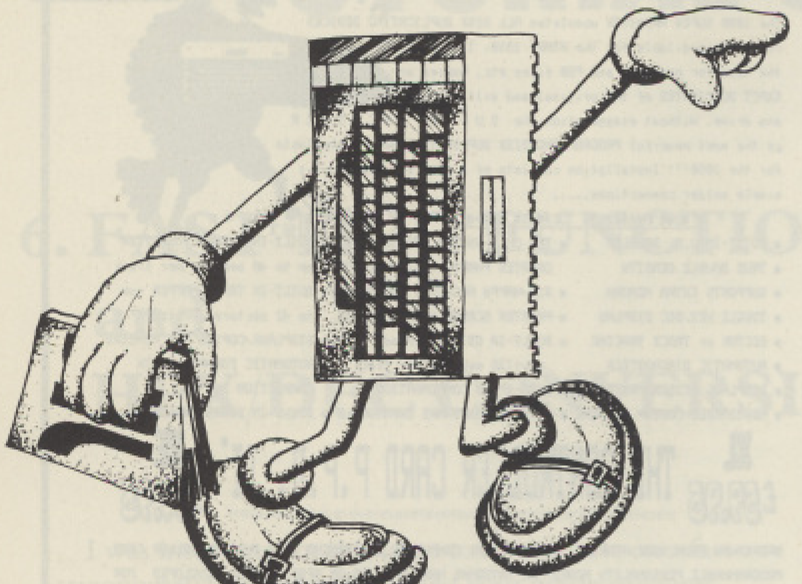
To clarify this let's take a specific case of a number X in the range 0 to 9. We can say that

X=VAL("X") or alternatively X=ASC("X")-ASC("0")

and in the other direction the character "X" to go in the string can be obtained from STR$(X) or CHR$(X+ASC("0")).

If this leaves you slightly confused I will try to answer any queries and I would also be pleased to hear your ideas for future articles. Just write to **Ian Finlayson, 60 Roundstone Crescent, East Preston, West Sussex, BN16 1DQ** enclosing a stamped envelope for a reply.

Mark Hutchinson's FIRST STEPS



After having told you in an earlier column how to save and load pretty pictures I thought it would be a good thing to tell you how to actually draw those pictures in the first place. This will not be a fully fledged drawing package, just the bare essentials and I will work through the program line by line so that you will see how it is built up, rather than having to look at it fully developed. If there are any routines which are not understood please write to me and I will endeavour to explain, either in this column or through your SAE.

LET'S PROGRAM!

The first thing is to pick a graphic mode and one of the best for this type of program is Graphics 7 as it has high resolution (lots and lots of tiny dots on the screen) and four colours. The first line of our program will therefore be

```
100 GRAPHICS 7
```

The COLOR command allows us to pick one of four colours and SETCOLOR lets us change that colour. Think of COLOR as one of four fountain pens and SETCOLOR as just changing the ink in the pen. COLOR 0 is the background colour and, when a point is plotted in this colour it cannot be seen. However, if used on top of another colour it will effectively erase the original colour. Our next line will turn on one of the colours

```
110 COLOR 1
```

Now we have to figure out a way to use the joystick to draw some pretty patterns. The joystick has eight possible positions as shown in Figure 1. We can read the position of the joystick by either using the STICK command or looking directly into the memory location using PEEK. I will use PEEK. If the joystick is pushed up, the memory will store 14 so we will tell the computer that, if it finds a 14, it must keep X at its present value (we are not moving sideways) and subtract 1 from Y to move the cursor up. These 'screen co-ordinates' are shown in Figure 2.

If we look at the screen, the top left is the zero position. Moving left to right are the X co-ordinates and from top to bottom are the Y co-ordinates. To move up we subtract 1 from Y, to move down we add 1 to Y. To move right, add 1 to X and to move left subtract 1 from X. Easy.

Our next line could be

```
120 If PEEK(632)=14 THEN Y=Y-1
```

but we would have to write eight such lines, one for each joystick position. There is a better way. As you can imagine, there can only be one value at any given time and it is possible using Boolean algebra to combine all the various conditions into one line. Sounds rough, eh? No need to sign up for the open university just yet. This is extremely simple.

BOOLEAN ALGEBRA AGAIN

If a statement such as (P=14) is correct (TRUE) then it is given a value of 1. If it is not correct (NOT TRUE) then it will be 0. So, another way of writing line 120 would be

```
120 Y=Y-(PEEK(632)=14)
```

When the PEEK(632) does equal 14, 1 is subtracted from Y as before but if it does not equal 14 nothing is subtracted. This line looks complicated so I will change it slightly to make it more readable and I will add the rest of the joystick values as well

```
120 P=PEEK(632)
130 Y=Y+(P=5)+(P=9)+(P=13)
140 Y=Y-(P=6)-(P=10)-(P=14)
150 X=X+(P=5)+(P=6)+(P=7)
160 X=X-(P=9)-(P=10)-(P=11)
```

I have split the routine into five lines for the sake of clarity, but it can go into one line. Let's look a little closer at the routine. From diagram 2 we can see that X will increase when the joystick returns the value of 5, 6 or 7. If it is 5 then the first conditional bracket will be true, and hence 1, and the rest 0. This means that 1 will be added to X. If the value is 13 then no change occurs to X. Each of the conditions will not be true and all will have a value of 0.

To see something on the screen we use the PLOT command, i.e. PLOT X,Y. Then we just go back and do it all over again

```
170 PLOT X,Y
180 GOTO 120
```

So far we have used just the one colour. We could use the keyboard to choose other colours but I will look at the joystick button, location 644, and cycle the colours using this. The reason for this is that when the button is pressed a value of 0 is returned and I wanted to show you the reverse of lines

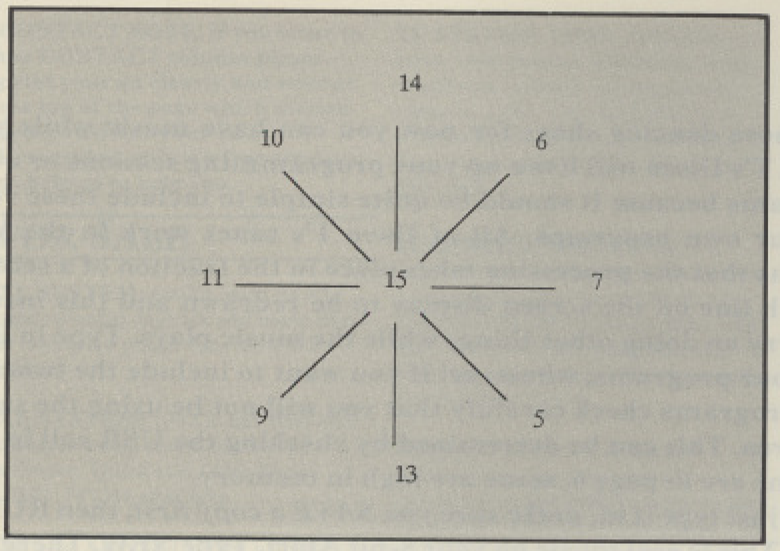


Figure 1 – Joystick positions

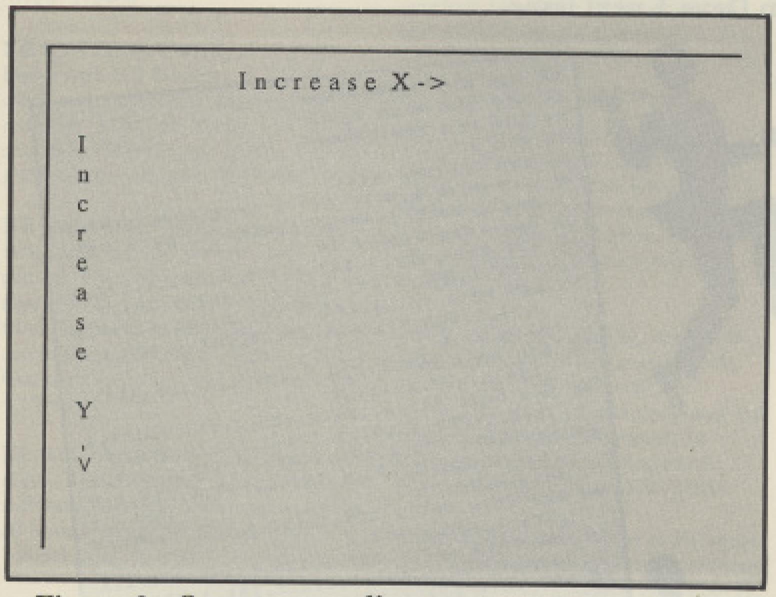


Figure 2 – Screen co-ordinates

130-160. Note that we must now move the GOTO and the PLOT

```
110 COLOR C
170 C=C+ NOT PEEK(644)
180 IF C>3 THEN C=0
190 PLOT X,Y
200 GOTO 110
```

In line 170, C will increase to a value of 4. As the COLOR statement can only understand the values 0-3, line 180 will automatically reset COLOR to 0, the background colour. It is easy to also test and reset X and Y in a similar manner to line 180. If X or Y passes outside the screen boundary ERROR 141 occurs and we must correct for this. If, for instance, Y reaches the bottom of the screen we can reset the cursor to appear at the top. This is called wraparound. 159 and 79 are the mode 7 screen co-ordinates with a window. So we now have

```
190 IF X>159 THEN X=0
200 IF X<0 THEN X=159
210 IF Y>79 THEN Y=0
220 IF Y<0 THEN Y=79
230 PLOT X,Y
240 GOTO 110
```

UPDATE

WHIST (ISSUE 32): For the first time in a long time we were plagued by that old problem of extremely long program lines with the result that the last few characters of line 3800 got chopped off. The last part of this line should read THEN M=N0. You will also need a few tricks to type the line in. Type POKE 82,0 and press RETURN before typing in the line or abbreviate NEXT to N. and leave out a few spaces.

Cassette users may have found problems when merging Listing 3 if they typed in the REM statements at the beginning of Listing 3. Just leave these out otherwise they will overwrite part of the original listing.

That is the basic program and I will leave it to you to customise it. For instance, a certain keystroke can send the program to the picture save or load routine that I gave you in a past article. This is up to you, I can gave you the basics but you will never learn until you try adding or amending the program. So get computing!

Some last tips before I go. Add this line before PLOT

```
PRINT "X= ";X;" Y= ";Y
```

This will let you judge the cursor position better. That is why I left the window in, but you may not wish the window to be saved, so try this line before you save the picture.

```
GRAPHICS 7+16+32 (or use GRAPHICS 55)
```

This line will keep the same graphic mode (7), the 16 will take away the window and the 32 will keep what you have drawn originally. I have not seen this used for several years but I think it is too great a trick to forget.

The screen save/load routines I gave will save all graphics modes to disk or tape or can be used to transfer RAM or character sets. If you look at issue 31, page 81 table 2 you will note offsets 4 and 5. These will hold the memory location that you wish to read or write to. The character set will be saved or loaded one byte at a time, so the IOCB routine can be used for fast access.

YOUR LETTERS

I have received some letters from readers, such as D. P. Allen of Camberley, asking about Turbo Basic. I never had the time to try this out, even though Les told me it is great. Perhaps during the summer I will have some spare time (some hope!).

If any beginners need help with programming, just send the problems, with an SAE to

G.M. Hutchinson
1 Hollymount
Finaghy
Belfast
BT10 0GL

DAVE T's DISCO

Put on those dancing shoes for now you can have music while you work! Dave T's Disco will liven up your programming sessions or even your programs because it should be quite simple to include these routines in your own programs. All of Dave T's tunes work in the VBI which means that the processing takes place in the fraction of a second it takes each line on the screen display to be redrawn and this means you can carry on doing other things while the music plays. Type in listings, run your programs, whatever! If you want to include the tunes in your own programs check carefully that you will not be using the same program area. This can be determined by checking the USR call in the listing. Some are in page 6, some are high in memory.

For now, just type it in, *make sure you SAVE a copy first*, then RUN it and dance! This is real music on your 8-bit Atari. Type NEW. There it's gone, or is it? Write a program and add the music, that's what your Atari is for.

More from Dave T next issue.

```
QK 1 REM ****************************
ZE 2 REM *        DAVE T's DISCO        *
RM 3 REM *       HIGH ON  A TRAIN       *
ZC 4 REM *             by               *
FO 5 REM *       David P. Thomas        *
EA 6 REM *------------------------------*
YZ 7 REM * PAGE 6 Magazine - England *
QR 8 REM ****************************
NO 9 REM
NJ 10 GRAPHICS 0:SETCOLOR 2,0,0:POKE 559,
   0:I=0
MN 20 READ Q:IF Q<>-1 THEN POKE 100*256+I
   ,Q:I=I+1:GOTO 20
VK 30 DATA 162,6,160,0,169,7,32,92,228,10
   4,96,-1
VW 39 FOR I=0 TO 20:POKE 120*256+I,0:NEXT
   I
ET 40 POKE 120*256,161:POKE 120*256+1,129
   :POKE 120*256+4,193
NA 41 POKE 120*256+5,165
GC 50 FOR A=0 TO 3:SOUND A,0,0,0:NEXT A:P
   OKE 53768,32+128
JK 51 RESTORE 120
QU 100 REM DRUM/BASS
GE 110 FOR I=1 TO 16:READ Q,W:POKE 117*25
   6+I,W:POKE 117*256+20+I,Q:NEXT I
EU 120 DATA 150,0,31,1,31,1,31,1,150,0,31
   ,1,31,1,50,0
WC 130 DATA 150,0,31,1,31,1,31,1,150,0,15
   0,0,31,1,50,0
UJ 140 RESTORE 160
DJ 150 FOR I=1 TO 16:READ Q:POKE 117*256+
   40+I,Q:NEXT I
UF 160 DATA 100,0,0,0,100,0,0,20
DJ 170 DATA 100,0,0,0,100,100,0,20
FS 180 I=0
GS 181 FOR I=1 TO 16:READ Q:POKE 117*256+
   60+I,Q:NEXT I
PP 182 DATA 203,203,203,101,203,203,203,1
   01,203,203,203,101,203,203,203,101
UU 189 DATA 169,169,169,169,169,169,169,1
   69,169,169,169,152,169,169,169,152
FD 200 I=0
WR 210 READ Q:IF Q<>-1 THEN POKE 1536+I,Q
   :I=I+1:GOTO 210
QM 213 DATA 32,150,6
MH 214 DATA 32,0,112
BZ 215 DATA 174,4,120,202,142,4,120,142,3
   ,210
SC 220 DATA 174,0,120,202,142,0,120,142,1
   ,210
ZO 230 DATA 174,1,120,202,142,1,120,142,5
   ,210
GD 240 DATA 174,2,120,189,0,117,201,1,240
   ,11
AC 250 DATA 173,3,120,105,5,141,3,120,141
   ,0,210
PS 260 DATA 173,3,120,141,0,210,174,0,120
   ,224,160,240,3,76,98,228
RN 270 DATA 162,168,142,0,120,162,136,142
   ,1,120,162,202,142,4,120
LW 280 DATA 174,2,120,232,142,2,120,189,2
   0,117,141,3,120
SQ 290 DATA 189,40,117,141,4,210,189,60,1
   17,141,2,210,224,16,240,3,76,98,228
PT 300 DATA 162,0,142,2,120,76,98,228,-1
FG 310 I=0
RC 320 READ Q:IF Q<>-1 THEN POKE 112*256+
   I,Q:I=I+1:GOTO 320
QW 330 DATA 174,10,120,232,142,10,120,224
   ,5,208,2,162,0,142,10,120,174,7,120,18
   9,0,118,233,1,109,10,120,141,6,210
KS 340 DATA 224,2,208,5,162,0,142,6,210
DQ 341 DATA 174,3,120,142,25,208
AH 342 DATA 173,40,120,105,1,141,40,120,1
   41,0,208,173,41,120,105,2,141,41,120,1
   41,1,208
DQ 343 DATA 173,42,120,105,3,141,42,120,1
   41,2,208,173,43,120,105,4,141,43,120,1
   41,3,208
AL 349 DATA 174,7,120
KU 350 DATA 189,0,118,201,0,240,1,96,162,
   0,142,7,210,96
GO 390 DATA -1
FF 400 I=0
IG 410 READ Q:IF Q<>-1 THEN POKE 1686+I,Q
   :I=I+1:GOTO 410
PG 430 DATA 174,6,120,232,142,6,120
PU 440 DATA 224,1,240,1,96
CV 445 DATA 162,0,142,6,120
PS 450 DATA 174,5,120,202,142,5,120,142,7
   ,210,224,164,240,1,96
RC 460 DATA 174,7,120,232,142,7,120
KM 470 DATA 189,0,119,141,158,6
YP 471 DATA 189,0,118,141,6,210
XZ 480 DATA 162,172,142,5,120
AI 485 DATA 174,7,120
PO 490 DATA 224,0,240,1,96
AG 500 DATA 162,0,142,7,120,96,-1
```



```
KP 600 REM **********
EF 610 REM *THE TUNE*
KT 620 REM **********
FU 630 I=1
XB 635 RESTORE 641
WF 640 READ Q,W:IF Q<>-1 THEN POKE 118*25
   6+I,Q:POKE 119*256+I,W:I=I+1:GOTO 640
VA 641 DATA 0,16,0,16
AR 643 DATA 127,2,127,2,135,1,151,1,171,1
   ,191,1,203,1,191,1,171,1,151,1,171,2
ZJ 645 DATA 171,1,171,1,151,2,135,1,127,1
   ,171,2,203,2,171,1,191,1,203,1,227,1,2
   52,4,0,16
PC 646 DATA 252,1,227,1,191,1,171,1,151,1
   ,135,1,127,1,113,1
BD 647 DATA 127,2,127,2,135,1,151,1,171,1
   ,191,1,203,1,191,1,171,1,151,1,171,2
ZV 649 DATA 171,1,171,1,151,2,135,1,127,1
   ,171,2,203,2,171,1,191,1,203,1,227,1,2
   52,4,0,16
OM 650 DATA 252,1,227,1,191,1,171,1,151,1
   ,135,1,127,1,113,1
AN 651 DATA 127,2,127,2,135,1,151,1,171,1
   ,191,1,203,1,191,1,171,1,151,1,171,2
PE 660 DATA 171,1,171,1,151,2,135,1,127,1
   ,171,2,203,2,171,1,191,1,203,1,227,1,2
   52,4
XM 670 DATA 191,1,171,1,171,1,171,1,191,1
   ,171,1,171,1,171,1
NS 680 DATA 203,1,191,1,171,1,151,1,171,2
   ,127,2
OA 690 DATA 227,1,203,1,191,1,227,1,203,1
   ,191,1,171,1,203,1,179,1,171,1,151,1,1
   79,1,171,1,151,1,135,2
AB 700 DATA 127,2,127,2,135,1,151,1,171,1
   ,191,1,203,1,191,1,171,1,151,1,171,2
HK 710 DATA 171,1,171,1,151,2,135,1,127,1
   ,171,2,203,2,171,1,191,1,203,1,227,1,2
   52,4,252,8
HI 720 DATA 252,1,252,1,252,1,252,1,252,1
   ,252,1,252,1,252,1,252,1
CJ 730 DATA 252,1,252,1,252,1,252,1,252,1
   ,252,1,252,1,252,1,252,1,252,8
OM 750 DATA 252,1,227,1,191,1,171,1,151,1
   ,135,1,127,1,113,1
XP 780 DATA 191,1,171,1,171,1,171,1,191,1
   ,171,1,171,1,171,1
NV 790 DATA 203,1,191,1,171,1,151,1,171,2
   ,127,2
NK 800 DATA 227,1,203,1,191,1,227,1,203,1
   ,191,1,171,1,203,1,179,1,171,1,151,1,1
   79,1,171,1,151,1,135,2
AE 810 DATA 127,2,127,2,135,1,151,1,171,1
   ,191,1,203,1,191,1,171,1,151,1,171,2
OY 820 DATA 171,1,171,1,151,2,135,1,127,1
   ,171,2,203,2,171,1,191,1,203,1,227,1,2
   52,4
DA 830 DATA 0,16
HW 840 DATA 127,1,135,2,151,1,171,2,191,1
   ,203,2,227,1,252,6
YH 850 DATA 252,1,252,1,252,1,252,1,252,1
   ,252,1,252,1,252,1,252,8
HR 860 DATA 127,1,135,2,151,1,171,2,191,1
   ,203,2,227,1,252,6
XZ 980 DATA -1,-1
JV 990 POKE 1746,I-1
HL 1000 GRAPHICS 0:SETCOLOR 2,0,0:SETCOLO
   R 1,0,12:SETCOLOR 0,7,10:D=PEEK(560)+2
   56*PEEK(561):POKE D+7,6:POKE D+6,7
JJ 1010 ? "AUDIO DESIGN COMPLIMENTS OF Da
   ve T"
PC 1020 ? "HIGH ON A TRAIN
   "
HP 2000 Z=USR(25600):POKE 559,34:END
```

CONTACT

CONTACT NOTE: If you write to the CONTACT column please print your ad clearly and state at the top of the page which section you would like your ad in. Remember, this is a free service, so help us to help you.

FOR SALE

XL SYSTEM: 800XL with XC11 tape recorder, joystick and many more. If interested phone 021-788-3975 (offers)

XE SYSTEM: 130XE and 1050 disk drive, joystick, books and lots of software. Quick sale £150. Phone (0592) 745244 after 6pm.

XE and XL SYSTEMS: 130XE, 1050 disk drive with US Doubler and games. Sell at £160. Also: 800 XL, tape recorder and games. £60. Tel. (0723) 372900

XE SYSTEM: 130XE, 1050 Disk Drive with US Doubler, RTIME-8 clock cartridge, 1029 printer, 1010 recorder, MAC 65, books, lots of tapes and disks. Worth over £1300. Sell for £450 o.n.o. will split. Tel: 0968 74929

XE SYSTEM: 130XE (unopened), 1050, 1020 printer/plotter, 1029 printer. Over 60 games on disk and tape, 100's of well known software titles, 11 books, 9 cartridges including assembler. Loads of PD titles. £250. Contact Chris on (0792) 898363 after 4.15pm

XL SYSTEM: 800XL, 1050 disk drive, XC12 recorder, 1029 Printer, software, joystick, books and manuals, all boxed only £299. Phone 0268 759004

CASSETTE DECK: Atari 1010 tape unit, suitable for use with any Atari computer. Leads etc. £20 Tel Crewe (0270) 214163

XL SYSTEM: Atari 800XL and two joysticks, £100 worth of software and all manuals. £90.00 o.n.o. Ring Steve on (0604) 719772

XL SYSTEM: 800XL, 64K computer and 1010 data recorder with £132 of software and a Quickshot II joystick. 1010 requires attention but is working. Total cost new £242, but will sell for £130 o.n.o. will not split, buyer collects or pays postage. Phone Matthew on Peacehaven (07914) 6153 between 4 and 8pm, weekdays only.

XL SYSTEM: I am going to upgrade to an ST thus Atari 800XL, 810 disk drive and 1010 cassette deck (slightly damaged) + lots of disks, games, joystick, books and Atari User Mags for only £350. Tel. Paul on Bradford 615998, after 5pm

XL PACKAGE: 800XL, 1050 disk drive, XC12 recorder, 1029 printer, PAGE 6 and Atari User mags, software and joysticks. All boxed as new. First offer over £300 secures. Tel. Jim on 0268 754043. Evenings only please.

XE SET-UP: Atari 103XE and Data recorder and software. £125 o.n.o. Phone C. Bishop (0202) 483790

XE SYSTEM: 130XE, 1050 disk drive, 1010 cassette, 4 joysticks, loads of software, utilities and magazines, manuals. £185. Tel. 0207 521716 or write to: D. Knighton, 79 Alderside Crescent, Lanchester. Co. Durham DH7 0PZ

XL SYSTEM: 800XL, 810 drive, XC11 cassette, all boxed with manuals. Lockable disc box (up to 100 discs), Joysticks, PAGE 6 Library disks 1-44, dust covers, PILOT programming language, etc. All for £350 o.n.o. Call Alan on 0344 56814

MIDI KIT: Digitrax 16 track professional sequencer, includes interface box and MIDI player (to play AMS files). Cost £169 will accept £80 o.n.o. Keith Poole on Cosham 0705 376091

PRINTER: Atari 1027 printer, excellent condition, 4 spare ribbons and AtariWriter for around £75. Tel. Mr. P. Djordjevic on Swindon (0793) 47777

XL SYSTEM: 800XL, 1050 disk drive, 1010 tape deck, speech synthesizer, set of Atari User mags. 5 books, stacks of software etc. £395, will split. Write: D. Purvis, 6 LLanbleddian Gardens, Cathays, Cardiff, CF2 4AT

8 BIT SYSTEM: 800XL with 1050 Disk Drive and 1010 Cassette deck, £130. Or 48K 400 with 'B' key keyboard with 1050 disk drive and 410 cassette. £120. John Bennett, 14 Killingworth Road, Killingworth, Newcastle Upon Tyne, NE12 0BR

PRINTER: Due to move to ST must sell 1029 printer as new, spare ribbons and paper. Also PAGE 6 issues 20-31, Monitor issues 12-18, 27 Atari Users's. Offers to Brian Perrie, 19 Cheviot Crescent, Dundee, DD4 9 QN

XL SYSTEM: Atari 800XL, XC12 tape recorder, over 100 original software titles and utilities. Atari User and PAGE 6 magazines. Sell the lot for £180. Tel. 761324. Kings Lynn, Norfolk

XL SYSTEM: 800XL, 1050 disk drive, XC11 cassette, touch tablet and software. £250. Phone 01 579 2888

BARGAIN XL SYSTEM: Atari 800XL, 1050 Disk drive, 1010 tape unit, manuals, dust covers, loads of games, 35 disks, tapes, etc. best offer £120. Tel. James 061 620 4053

PRINTER: Atari 1027 Printer, little used £55.00. Phone David on Northampton (0604) 711647

XL SYSTEM: 800XL, rev. C, 1050 drive, 1029 printer, joysticks, magazines, 100+ software titles £250 o.n.o. Tel. Newport (0633) 615331

XL SYSTEM: Atari 800XL, 1010 recorder, 1050 disk drive with write protect switch, touch tablet, books, mags. £170. Phone Jon (09747) 212

PERIPHERALS: 1029 Printer £70. 1020 Plotter £40 1010 recorder £15 Tel. Croydon 6834087 (Evenings)

810 ARCHIVER: 810 disk drive in mint condition with Archiver chip, software and full documentation. £80 Phone Bob, 0360 312861 evenings or weekends

BOOKS: Your Atari Computer £6, The Atari Assembler book £5, Atari Assembler Cartridge £6. Pair of paddles £6. Phone Steve on 01 851 5942 after 7.00pm please.

ST MONITOR: Atari Mono monitor £70. Call 01 941 3040

CHIPS: Surplus to need – complete unused set of US Doubler chips £15. Write to J. Cutler, 44 Water Street, Great Harwood, Lancs. BB6 7QR

INTERFACE: Atari 850 plus printer cable and manual. £80 o.n.o. De Re Atari £8. Tel. 07048 70788 after 6pm.

WANTED

NEC 8023 PRINTER: URGENTLY required. Ours finally died, and we need one for the listings. Good price paid. Contact Les Ellingham on 0785 213928

EXCALIBUR: The hard to find APX game designed by Chris Crawford. A good price is offered – £25 or more. Contact Andrew S. Davidson, 91 The Avenue, Ealing, London, W13 8JT. Tel. 01 997 7972

MAGAZINES: ANALOG issues 59 and 60. Also ACTION Cartridge. Phone 0602 430733

FSII: Sublogic's Flight Simulator II on cartridge for Atari games machine. Phone John 01 743 6879

BOOKS: Revised Mapping The Atari, magazines and books. Jaro Striz, Mytna 17, 917 01 Trnava, Czechoslavakia

PRINTER: 1029 printer about £60 or swap for 3M photo-copier. P. Simpson, 23 Tegfan, Trallwn, Llsamlet, Swansea, SA7 9XL

THE REAL THING: Atari 800 wanted, NOT XL, also RAM expansion for an 800. Len Lawson (0284) 702373

BOOKS: Graphics And Arcade Design, Atari Roots, ABC's of Atari, Atari Basic Sourcebook, Computer Animation Primer. Derryck Croker 0923 673719

PEN PALS/ CONTACT

FORTH: Any PAGE 6 reader interested in FORTH on any Atari machine. Lets pool our ideas, experience and code. Abaq development sites please write. All letters answered. David Thompson, 204 Hampstead Road, Benwell, Newcastle upon Tyne, NE4 8PT

ST USERS: I want contacts from anywhere to exchange hints, tips, etc. All letters answered. Scott, 18 Neath Road, Scunthorpe, South Humberside, DN16 1LW

8 BIT USERS: I would like to contact any Atari users in my area for exchange of information, ideas, etc. I have an 800XL and disk drive. Please write to Nigel Edwards, 35 Meadow Way, Leighton Buzzard, LU7 8XN

FEMALE ST OWNER: wishes to write to other STers to swap info, hints, tips, etc. Prefer maturer types. Write to SKV, 98 Thompson Avenue, Kew, Richmond, Surrey

FROM AUSTRALIA: I recently bought an Atari 520ST. I'm interested in graphics programs. Any tips please write to Mr. R.P. Bedford, 18 Rex Street, Gosnells, 6110, West Australia.

ST USERS: I'm new to the bright and colourful world of Atari, seeking pen friends to swap ideas, hints, tips, you name it! Please reply to: Nick Bate, 15 Parkfield Close, Gossops Green, Crawley Sussex, RH11 8RS. Tel. 0293 29727

ST PENPALS: To swap hints and tips etc. On a worldwide basis. All letters answered. Contact Simon Miller, 109 West Way, Broadstone, Dorset, BH18 9LH

NEW ST USER: Seeks pen friend in similar situation. Write to Cameron Marshall, 19 Belle Vue Road, Wakefield, WF1 5NF.

GLASGOW AREA: Contact with other 8 bitters wanted. Is anybody still out there? Phone Laurie on 0389 841 764 evenings

STers: To swap hints, tips, ideas, etc. Please write to Gary Wright, 14 Beeston Road, Broughton, Chester, Clwyd, CH4 0SB

ST PEN PALS: wanted to swap info and PD programs (especially GFA Basic or pro-sound demos). Please write to Tony Longworth, 13 Greenfield Road, Little Sutton, South Wirral, Cheshire, L66 1PE

And finally ...

Could anyone DONATE a program to the Royal Liverpool Childrens Hospital School. They have an Epson compatible colour printer but they don't have a program to dump out AtariArtist/Micro-Painter pictures in colour. If anyone has such a program please write to Miss. E. Barlow, Royal Liverpool Childrens Hospital School, Myrtle Street, Liverpool, L7 7DG Thanks.

CONTACT is free of charge to individuals who want to sell, swap, contact others or need help. Anything to do with Atari will be accepted with the exception of the sale or exchange of commercial disk or cassette software. Just write it down *briefly* and send it to CONTACT, PAGE 6, P.O. BOX 54, STAFFORD, ST16 1DR

THE
RESOURCE FILE

The Resource File is a service provided by PAGE 6 to help Atari owners (both 8-bit and ST) find sources of information, help and supply. An entry in this feature does not necessarily imply any endorsement by PAGE 6 and readers are advised to check for themselves to ensure that the information is still current. We would ask any readers who find information to be inaccurate or out of date to let us know so that an entry may be amended or deleted.

RETAILERS

ABC
135 St. Leonards Road
Leicester
LE2 3BZ
Tel. 0533 700190

ATARI WORLD
15, Fennell Street
Manchester
M4 3DU
Tel. 061 834 4941

BRIGHTON COMPUTER EXCHANGE
2, Ann Street
Brighton
BN1 4GP
Tel. 0273 686650

CHIPS
53, Rugby Road
Worthing
Sussex BN11 5NB

COMPUTER ADVENTURE WORLD
Bank Buildings
1A, Charing Cross
Birkenhead L41 6EJ
Tel. 051 666 1132

COMPUTER CAVERN
21, Harris Arcade
Reading
Berks. RG1 1DN
Tel. 0734 474768

COMPUTER CENTRE
174, High Street
Hornchurch
Essex
Tel. 04024 75613

GAMER
71 East Street
Brighton
Sussex BN1 1HQ
Tel. 0273 728681

GLASGOW COMPUTER CENTRE
122, West Nile Street,
Glasgow,
G1 2QZ
Tel. 041 332 8246

HI-FI WESTERN LTD.
52, Cambrian Road
Newport
Gwent
Tel. 0633 62790

INTOTO
1, Heathcoat Street
Hockley
Notts. NG1 3AF
Tel. 0602 410987

JENNINGS STORES
244 – 248, Hertford Road
Enfield
Middx
Tel. 01 804 1767

LADBROKE COMPUTING LTD.
33, Ormskirk Road
Preston
Lancs. PR1 2QP
Tel. 0772 21474

LIVINGSTON COMPUTER CENTRE
17, The Mall
Craigshill Shopping Centre
Livingston
West Lothian
Tel. 0506 36978

MICRO-TRONICS
27a, Market Street
Tamworth
Staffs
Tel. 0827 51480

P.F.MURPHY & SONS LTD.
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Drogheda
Co. Louth
Ireland
Tel. 041 37292

ONE STEP BEYOND LTD.
11a, Castle Meadow
Norwich
NR1 3DG
Tel. 0603 663796

PEATS ELECTRONICS
197, Parnell Street
Dublin 1
Ireland
Tel. 0001 727799

RADFORD HI-FI LTD.
52, Gloucester Road
Bristol
Avon
Tel. 0272 428247

SILICON CENTRE
7, Antigua Street
Edinburgh
Scotland
Tel. 031 557 4546

SOFTWARE EXPRESS
514 – 516, Alum Rock Road
Alum Rock
Birmingham B8
Tel. 021 328 3585

SOFTWARE EXPRESS
212, Broad Street
Birmingham
B15 2AY
Tel. 021 643 9100

SOFTWARE EXPRESS ATARI CENTRE
9, Exeter Street,
Plymouth,
Devon
Tel. 0752 265276

A.S. WOOTTON & SON
116, Edleston Road
Crewe
CW2 7HD
Tel. 0270 214118

YORK COMPUTER CENTRE
9, Davygate Arcade
Davygate
York YO1 2SU
Tel. 0904 641862

USER GROUPS

ABC
Contact Mike Donoghue, 135, St. Leonards Road, Leicester, LE2 3BZ. Tel. 0533 700190. Retailer and both 8-bit and ST user groups.

ATARI USER GROUP (IRELAND)
Contact Mike Casey, 3 St. Kevins Park, Kilmacud, County Dublin, Ireland. Tel. 01-881830 or DUBBS 01-885634 (24 hour). Monthly meetings and newsletter.

BESTWOOD 8-BIT USER GROUP
Contact David Taylor, 60 Stevenholme Crescent, Bestwood Park, Nottingham, NG5 5JW. Tel. 0602 209735. 8-bit local users only.

BOURNEMOUTH AND POOLE ATARI USER GROUP
Contact Colin Hunt, 248, Wimborne Road, Oakdale, Poole, Dorset. ST, 8-bit, hardware and software development.

BURY ST. EDMUNDS USER GROUP
Contact Gary Brummage, 22, Ridley Road, Bury St. Edmunds, Suffolk, IP33 3HS. Please send S.A.E. for details.

CROMWELL ATARI USER GROUP
Contact Dave Leggett, 3, Chestnut Close, Brampton, Huntingdon, Cambs. Tel. 0480 50553. All users welcome.

FLOPPYSHOP ST
Contact Steve Delaney, 50, Stewart Crescent, Northfield, Aberdeen, AB2 5SR. Tel. 0224 691824.

The GATEWAY CLUB
Contact Phil Herberer, 164d Radcliffe Road, Lakenheath, Suffolk. Tel. (Eriswell) 2363. All computer club with Atari section. Meets once a month.

LACE (LONDON ATARI COMPUTER ENTHUSIASTS
Contact Glenn Leader, 143 Richmond Road, Leytonstone, London E11 4BT. Tel. 01 556 0395. XL XE ST users. Great newsletter and PD library.

MACCLESFIELD COMPUTER CLUB
Contact Peter Solomon. Tel. 0625 20782 evenings and weekends. All computer club with Atari section. Meets fortnightly.

MERSEYSIDE ATARI CLUB
Contact Mike Lynch, 24, Oakdene Road, Anfield, Liverpool, Merseyside, L4 2SR. Tel 051 264 8435. ST ONLY. Regular meetings, newsletter and more.

RAGE HARD A.U.G. (8-bit)
Contact Tony Longworth, 13, Greenfield Road, Little Sutton, South Wirral, Cheshire, L66 1PE. Tel. 051 339 0405. For 8-bit users everywhere. Send s.a.e. for details.

ST CLUB
Contact Paul Glover, P.O. Box 20, Hertford, S13 8NN. Mail only(?). Worldwide.

STARLIGHT ATARI CLUB
Contact Douglas Woodcock, 8, Ethnard Road, Peckham, London, SE15 1RU. Tel. 01 639 3109 after 5 pm. Members with disk drive (8 bit)

VTB ATARI COMPUTERCLUB
Contact Christian Delabarre, Hekstraat 7, 9050 Evergem, Belgium. Tel. 091/26.29.29. For XL, XE, ST. Organised talks/visits etc.

WORLD ATARI PENPALS Int. User Group (WAP)
Contact Max Terveen, Magerhorst 8, Alphen a/d Rijn, 2402 LP, The Netherlands. Tel. 01720 45583. Members in USA, Canada, France, U.K., Greece, Germany, Saudi Arabia. Have circulating disk (8-bit and ST). Mail only.

Do you want others to know about your group? Send details as above ONLY (5 words max. on Members!) on a plain sheet of paper headed RESOURCE FILE – USER GROUPS.

That's all you get! We will not publish any other details as meeting times and places tend to change. Appoint someone responsible to handle any enquiries received.

BBS

Name: **GAMLINGAY TBBS**
Number: 0767 50511
Hours: 24 hours
Baud: 300 – 2400
Features: Atari SIG and program library

Name: **THE VILLAGE**
Number: 01 464 2516
Hours: 24 hours 7 days
Baud: V21, V22, V22BIS, V23
Features: 8 bit area, ST area, CP/M area

Name: **INFOMATIQUE**
Number: 0001 764942 (Dublin)
Hours: 24 hours
Baud: 300/300 and 75/1000
Features: ATARI SIG and program library

Name: **CHARLY**
Number: 0451 31642 from Germany
010 49 451 31642 from England
Hours: 24 hours 7 days
Baud: 300, 8n1
Features: Atari 8-bit and ST areas. P.D. software. Some German required!

Name: **THE ARK**
Number: 021 353 5486
Hours: 24 hours 7 days
Baud: 300 or 1200/75
Features: 8 bit with Downloads, hints, swaps etc.

Name: **CHASE ST USER GROUP**
Number: 05438 71562
Hours: 2100 Friday to 0900 Monday
Baud: 300 – 1200 (V21/V23)
Features: Atari PD, MSDOS PD, CPM80

Name: **THE GNOME AT HOME**
Number: 01 888 8894
Hours: 24 hours/7 days
Baud: V23 viewdata
Features: ST area frame *1632.0#. ST Babble starts on frame *1632.9#.

Name: **CBABBS**
Number: 021 430 3761
Hours: 24 hours/closed Thursdays
Baud: 300
Features: ST/8 bit, Email to USA and Canada

Name: **LEICESTER CENTRAL**
Number: 0533 700914
Hours: 24 hours
Baud: 300 and 1200/75
Features: 8 bit area and ST area

PAGE 6 reserves the right to delete any entry from this feature for any reason. Inclusion does not imply any endorsement by PAGE 6 and PAGE 6 can accept no responsibility for the accuracy or completeness of an entry. Please tell us if you find any entry out of date.

Do you run a Bulletin Board which caters mainly for Atari 8-bit or ST? For an entry in this feature please send us details as above (5 words max on Features!) on a plain sheet of paper headed RESOURCE FILE – BBS.

Any background information included will be filed for reference but not published.

NEW LOW PRICE ST!



ST PRICE INCREASE

Due to a worldwide shortage of memory chips, prices of many computers have gone up. From April 1988, the Atari ST range is also likely to be affected. For details of any price increase, please return the coupon below for our latest literature.

£260

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Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created. Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built in power supplies and built in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 3 retail outlets at Sidcup, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £9 million and in excess of 80 staff, we offer you unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

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** NEOchrome Sampler - colour graphics program * 1st Word - Word Processor*

In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of seven full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

1Mb RAM UPGRADE: Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT = £100).

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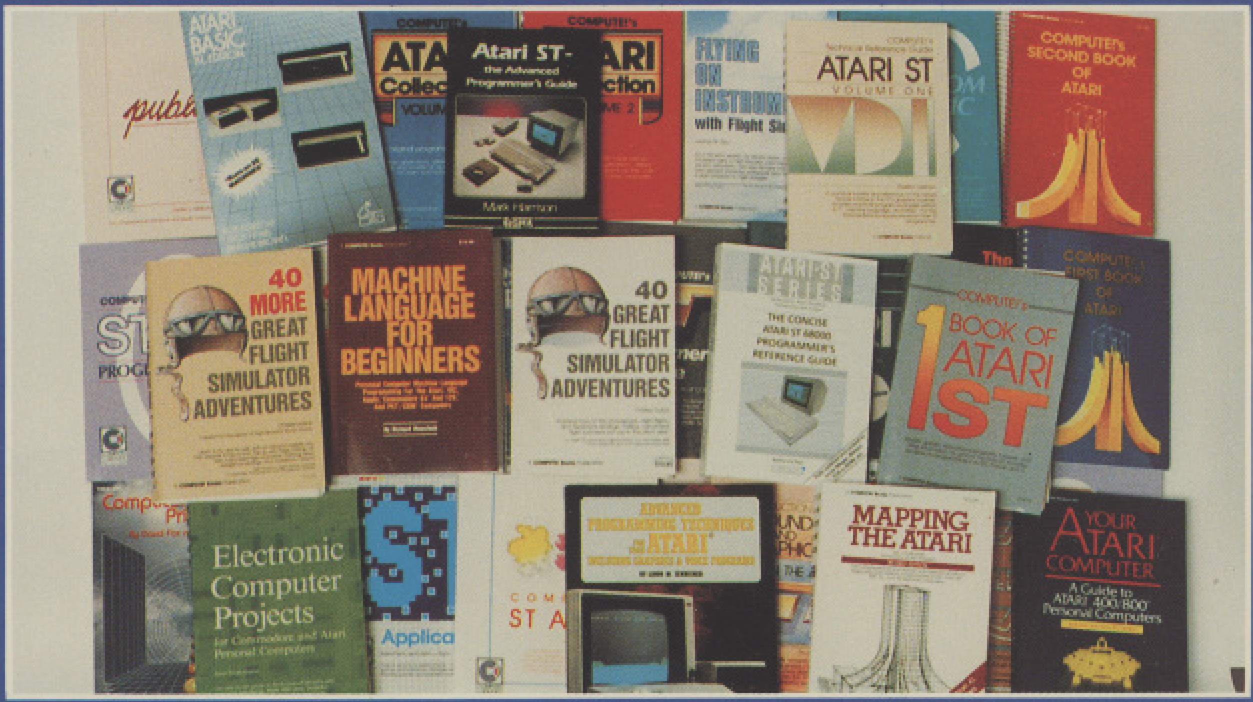
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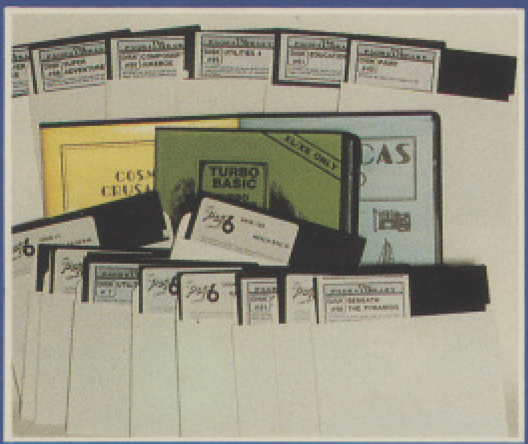
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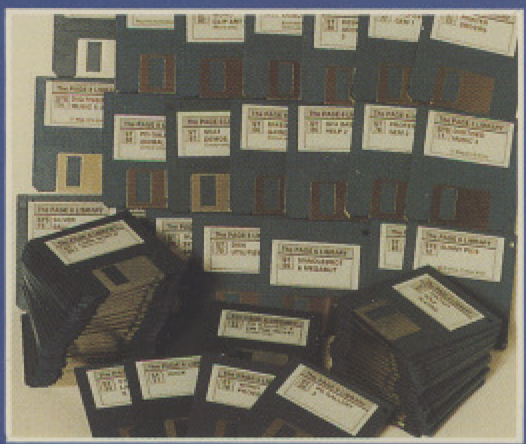
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